

Pseudevernia furfuracea, the mummy's lichen at the Farlow Herbarium

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ABSTRACT. – We recently rediscovered a specimen of the lichen *Pseudevernia furfuracea* (L.) Zopf, that is over 2,500 year old. It is part of the Farlow Herbarium collection (FH-TUCK) at the Harvard University Herbaria and was found on an Egyptian mummy from Thebes that was unwrapped by the Montreal Natural History Society in 1859. This paper presents a historical review of the lichen and the mummy as well as information on the uses of lichens in ancient Egypt.

KEYWORDS. – Sir William Dawson, embalming, *Evernia*, David Allan Poe Watt, hieroglyphics, lichen substances, Natural History Society of Montreal, Redpath Museum, Tuckerman

We recently rediscovered a lichen specimen of *Pseudevernia furfuracea* (L.) Zopf (syn. *Evernia furfuracea* (L.) W. Mann) that was found in between the wrappings of a female Egyptian mummy. The mummy was unwrapped in 1859 by the Natural History Society of Montreal and part of the recovered lichen specimen had been sent, probably by D. Allan Poe, to Edward Tuckerman for identification. Tuckerman included it in his collection on sheet no. 330. His herbarium was purchased in 1886 after his death by William G. Farlow, and it is now part of the cryptogamic collection of the Farlow Herbarium (FH; Pfister 1982). The lichen specimen is kept in a hand folded package and is labeled in Tuckerman's handwriting '*Evernia furfuracea* cetatis c. 2500 ann.!' On the bottom of the package it says further: 'From within of wrappings of a Mummy fr. Egypt. Est. as from 500 to 800 years B.C. old. Unrolled by the Montreal Nat. Hist. Society in 1859, as see Mr. D. Allan Poe's letter of 1 Nov. 1859. "Several handfuls of the lichen were found on the chest of the Mummy, over the spices, + within all the wrappings"' (plate 1).

David Allan Poe, who changed his name in 1862 to David Allan Poe Watt, was a life member of the Natural History Society of Montreal (Miller 2000, Monck 1862, Natural History Society 1859). He was active in several committees from 1857 onward and was appointed as one of the vice-presidents at the annual meeting in 1881 (Natural History Society 1881). Poe was possibly part of the party that unwrapped the mummy in 1859. The unwrapping probably took place at McGill College (now McGill University) in Montreal, Canada. Unfortunately, no first hand account of the unwrapping nor the letter mentioned by Tuckerman on the package could be found in the archives of FH or at McGill University.

A duplicate of the *Pseudevernia furfuracea* that was found on the mummy is deposited in the General Herbarium at FH. It was originally part of the Gray Herbarium and is labeled as '*Evernia furfuracea*, from chest of a mummy, Dawson: Can. Nat. & Geol. 7: 88-9. 1862'. A third piece of this lichen is housed at the British Natural History Museum (BM; LaGreca, pers. comm.). It is unknown if the specimens from the Gray Herbarium and from BM had been sent on behalf of the Natural History Society of Montreal or were distributed by Tuckerman.

Sir William Dawson, whose name is mentioned on the duplicate of *Pseudevernia furfuracea* in the General Herbarium at FH, became the principal of McGill College in Montreal in 1854 (Nova Scotia Museum 2008). Dawson was acting president of the Natural History Society of Montreal for a number of years, starting in 1856-1857 (Natural History Society 1881). He was named the director of the Redpath

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Plate 1. Specimen of *Pseudevernia furfuracea* at FH that is the subject of this article (scale bar = 1cm). Figure 1, specimen. Figure 2, original packet from the Tuckerman Herbarium (FH-TUCK).



Plate 2. Figure 1, the mummy “Abothloé”. Figure 2, hieroglyphic representation of the name of the mummy “Abothloé”. Figure 3, hieroglyphics that possibly represent ‘lichen’ (in gray box).

Museum of Natural History in 1882, when Peter Redpath donated money to McGill College for the construction and establishment of a museum. The collection of the Redpath Museum includes many specimens from Dawson’s personal collection, including three Egyptian mummies.

The mummies were brought to Montreal as part of ‘Egyptian curiosities recently brought to this City by the Hon. James Ferrier, and presented by him to the Natural History Society’ (Dawson & a committee 1859). Amongst these ‘curiosities’ was a mummy of an aged lady from Thebes (plate 2, figure 1). According to the investigations she was in excellent preservation, and her body was entombed in a highly ornamented case (Dawson & a committee 1859). Her name is preserved opposite of the portrait on the bottom of the coffin and ‘may have been “Abothloé”’ (Dawson & a committee 1859; plate 2, figure 2). Hair analysis and head measurements revealed that she was a person of the European type. She was embalmed in what appeared to be the oldest style with ‘A quantity of lichen ... placed over the front part of the body to give it a more rounded contour, and to retain the odor of the spices; and it had been swathed in numerous linen cloths, folded over the front, and with many loose pieces put in to fill out the form’ (Dawson & a committee 1859).

The pieces of *Pseudevernia furfuracea* that were sent to Tuckerman are reasonably large (up to about 5 cm long) and are still partly attached to a piece of a twig (plate 1, figure 1). If the dating for the embalmment of Abothloé mentioned on the package is correct (500-800 B.C.), the age of the lichen ranges at least from about 2500 to 2800 years. The use of the words ‘oldest style of embalming’ in Dawson’s paper (1859) can be confusing, however, and possibly could lead to a different dating of the mummy and therefore of the lichen. The idea of mummification probably existed already during the predynastic times (before 3050 B.C.) when naturally dried bodies were buried in sandy pits with some burial objects (Ikram & Dodson 1998). The way Abothloé was mummified included the desiccation of the body (probably with natron), the removal of the inner organs, and the coverage of parts of the body with oily or resinous varnish and with a paste of ground spices (Dawson & a committee 1859). The brain was removed through the nose (Lawson, pers. comm.). Square plates of copper foil had been placed over her face and the upper part of her feet.

The regular use of natron and resin for mummification is known since about the Middle Kingdom (2066-1650 B.C.) and also the removal of the brain through the nose is known before the time Abothloé was embalmed (Ikram & Dodson 1998). As far as we know, during the New Kingdom (1549-1069 B.C.) and the Third Intermediate Period (1069-656 B.C.) lichens were used in mummification. The body cavities of e.g., the mummies of Merenptah, Siptah, Ramses IV, a priest from the 21 dynasty (1069-940 B.C.), and an unknown male from the 23-24 dynasty (743-717 B.C.) were filled with *Pseudevernia furfuracea* (Dawson 1934, Germer 1988, Ikram & Dodson 1998). Normally, the mummies were filled with sawdust, linen or sand after they were treated with resin for disinfection.

But where did the lichens used in mummification come from? The first herbarium specimen of any lichen was not collected until around 1750 by Frederic Hasselquist (now at UPS), and the first published records of lichens from Egypt are known from 1813 (Delile 1813a, 1813b). We therefore do not have direct records of the lichens that were possibly growing in ancient Egypt. However, Baumann (1960) stated that *Evernia furfuracea* did not grow in Egypt and also Seaward & Sipman (2006) did not list *Pseudevernia* in their checklist of lichenized and lichenicolous fungi for Egypt. According to Pouchet (1936), *E. furfuracea* and the very similar species *E. prunastri* (L.) Ach. do not grow in Egypt because of the dry air. '...but in the last century Forstal saw several consignments being unloaded in Alexandria. These had been shipped from the Islands of the Archipelago' (Pouchet 1936). Dawson (1862) states that the lichens had been imported into Egypt from Lebanon or the hills of Macedonia, but he does not support this assertion. There are several other countries that are mentioned in the literature as possible traders in lichens with Egypt. Southern Europe (such as Greece) and Asia Minor are the general regions from which the lichen could have had been imported (Germer 1988, 1993). However, we have no evidence from which country or region lichens were imported into Egypt.

Unlike many higher plants used in the embalming process, the hieroglyphics for the word 'lichen' are still arguable. Plate 2, figure 3 shows the hieroglyphics that possibly represent 'lichen' (Dawson 1934) with its transcription being 'k3.t-šw.t' (Dawson 1934, Germer 1979, Von Deines & Grapow 1959). Dawson (1934) interpreted the beard shaped sign in plate 2, figure 3 (marked with a gray rectangle) as the part that gives an indication about the shape of the plant 'k3.t-šw.t' that was used as a medicinal drug, and suggested that it is 'some kind of lichen'. If this is true, then lichens were used externally and as a fumigant for curing ulcerous or other infections, the mht.t-disease (the nature of this disease is unknown; this is the reason why the Egyptian transcription is still used), and pain (Germer 1979). Plinius Secundus speaks in 1513 of two different lichen species as being good for treating the skin disease 'lichen', stigmas, bleedings, and icterus (König 1983). This is not surprising, because lichens are known for their antimicrobial properties (Richardson 1974). Von Deines & Grapow (1959) and Germer (1988) mention 'k3.t-šw.t' as being used as an addition to incense and in bandages. It is well known that some lichens, including *Pseudevernia furfuracea*, are used in the perfume industry and are able to enhance the aromas from other plants (Lindley 1838, Perez-Llano 1944, Pouchet 1936). We also know for sure that Egyptians used *P. furfuracea* in baking bread as a substitute for *Evernia prunastri*, and that it was an additive in making hair powders (Lindsay 1856). As we are aware, fruticose lichens often resemble the shape as illustrated in the hieroglyphics in plate 2, figure 3. But as pointed out by Germer (1979), *P. furfuracea*, probably the most commonly used lichen in ancient Egypt, looks very different in its growth form. So it will remain unsure if the plant 'k3.t-šw.t' means 'lichen', a specific lichen species or simply some other plant.

The function of lichens used in mummification is not yet completely solved (Baumann 1960, Ikram & Dodson 1998). In cases where mummies were stuffed with them they might have been applied to preserve the shape of the body, for antimicrobial purposes, for preservative properties or for their absorbent character (Baumann 1960, Ikram & Dodson 1998, Richardson 1974). In cases such as for Abothloé, where the lichens were applied within the wrappings, they indeed might have been added to preserve the odor of the other spices as mentioned on the package of the herbarium specimen.

Dawson (1862) made an interesting connection between the *Pseudevernia furfuracea* that had been found on the mummy and the *P. furfuracea* that occurs in the White Mountains, Maine. The paper is about the flora of the White Mountains and Dawson includes cryptogams in his investigations. He describes on page 88 the unwrapping of the mummy, the findings of the spices and the lichen *P. furfuracea* within the wrappings as well as the necessity of the import of the species into Egypt. After he mentions the identification of the lichen by E. Tuckerman, he states '... as it occurs on the White Hills and on Katahdin in Maine. These facts are however easily explicable in comparison with those that relate to the flowering plants.' According to Dawson (1962) the spores of the lichens that 'float lighter than the lightest down in

the air' may have drifted over oceans and continents and 'dropped everywhere to grow where conditions may be favorable.' His hypothesis is that when the Egyptian embalmer had used the 'first created specimens of *Evernia furfuracea*, it might easily within the three thousand years or so since his work was done, have floated round the world and established itself on the White Hills'. His article and hypothesis was recently cited in a newspaper article about atmospheric deposition (Collard 1990).

Interestingly, the secondary compounds of the *Pseudevernia furfuracea* found on Abothloé are still preserved, even after over 2500 years. As analysis with high performance liquid chromatography (HPLC) reveal, physodic acid, isophysodic acid, atranorin, and chloroatranorin are detectable, along with degradation products from physodic and/or oxyphysodic acid (Elix, pers. comm.). Results from thin layer chromatography (TLC) were, however, negative (LaGreca, pers. comm.).

The mummy Abothloé is one of the Egyptian mummies on permanent display at the Redpath Museum, McGill University, Canada.

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