

HISTORIC WONDERS OF THE FUNGAL WORLD: THE EVIL DEMON HAND AND *FUNGUS DIGITATUS*

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The fungal kingdom is full of wonders but every so often you can be really astounded by a truly remarkable and unique encounter. This happened when an extraordinary fungal necklace in the collection at Harvard University's Peabody Museum of Archaeology and Ethnology was found. It had been collected in 1926 from Dutch New Guinea (now the West Papua Province of Indonesia) by anthropologist Patrick Putnam from the neck of a headman or witch doctor. It was a most unusual fungal object and was described as one of the "Rare Wonders of the Fungal World" in the

summer 2015 issue of FUNGI magazine (Blanchette, 2015). The necklace was made from the stipitate fruiting body of a glossy red *Ganoderma* (a species in the *Ganoderma lucidum* complex). It is a beautiful but haunting object consisting of a basidiocarp that started to regrow and produced many long thin projections that resembled human fingers (Figure 1). They even had knuckle-like swellings and each had a growing tip that resembled finger

nails. This is a very unusual and creepy looking object that would fit nicely into a witch doctor's paraphernalia for use to conjure up powerful emotions and fear of the unknown. You would not expect a rare fungal wonder such as this to occur a second time but some new discoveries found in old collections and some new finds show somewhat similar weird and wonderful *Ganoderma*. Finding these are rare events and the occurrence of the ones we discovered took place at about 100 year intervals.

After the 2015 issue of FUNGI magazine revealed the fungal necklace, an old illustration of a remarkably similar fruiting body was found in an antiquarian bookshop in Germany called



Figure 1. A *Ganoderma* fruiting body with finger-like projections that was used as a necklace for the headman or witch doctor. Collected during a Harvard University expedition to Dutch New Guinea in 1925 and is in the collection of the Peabody Museum of Archaeology and Ethnology, Harvard University. Photograph taken by the author and © President and Fellows of Harvard College, Peabody Museum of Archaeology and Ethnology, PM# 27-56-70/D2797 (digital file# 99310124).

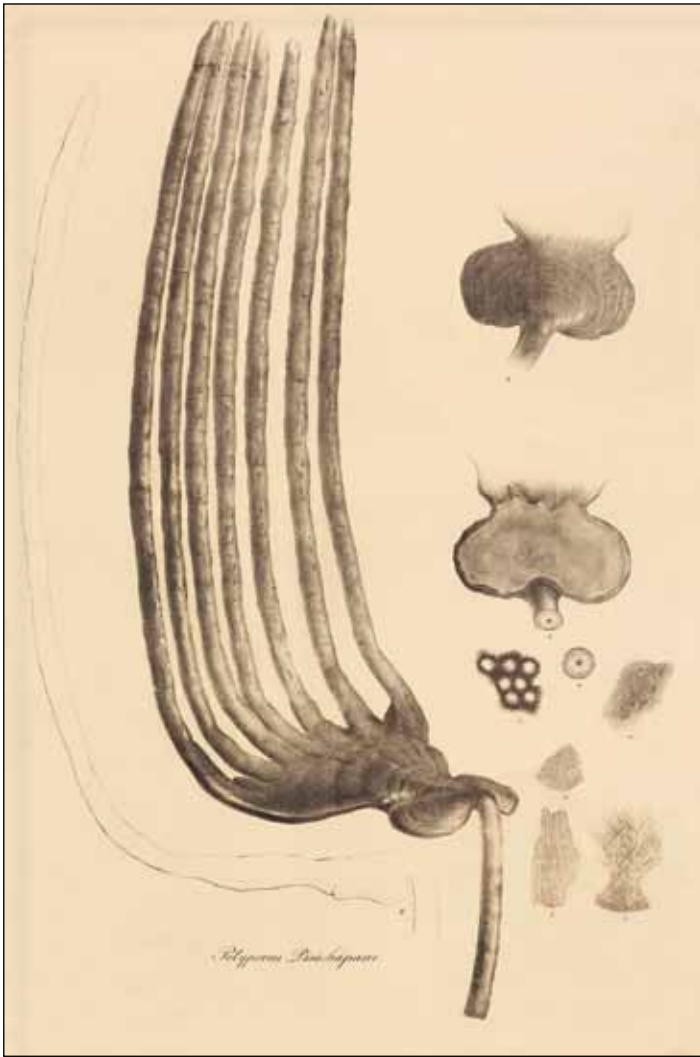


Figure 2. Illustration from an 1826 article by the Nees von Esenbeck brothers where they described a new species, *Polyporus pisachapani*. This *Ganoderma* with monstrous re-growths resembling fingers was drawn life size (30 inches in length). The species name *pisachapani* translates to “hand of the evil demon”. The illustration, a foldout in the publication, was digitally manipulated to remove the folds and age spots that occurred on the original drawing.

Figure 3. Illustration from a 1750 publication, *Herbarium Amboinense* by G. E. Rumphius, showing *Fungus digitatus*. The fungus was collected in the late 1600’s and is the earliest example of a fingered *Ganoderma* that has been published. Figure is reproduced with permission from the Wangensteen Historical Library of Biology and Medicine, University of Minnesota and was digitally manipulated from the historic context to improve image quality.

Mykolibri. This was from an 1826 publication describing a new species named *Polyporus pisachapani* (Nees von Esenbeck and Nees von Esenbeck, 1826). The specific epithet ‘*pisachapani*’ is derived from two Sanskrit words, namely *piśāca* (= evil demon) and *pānī* (= hand), and translates to “hand of the evil demon”. Two brothers, Christian Gottfried Daniel Nees von Esenbeck and Theodor Friedrich Ludwig Nees von Esenbeck, described an “extraordinary polypore the shape of a hand bearing very long fingers of very dark color”. They report the fungus fruiting body had a varnish-like crust and looked like the carpus of the hand from which

seven very long monstrous appendages (fingers) rise up. These projections are 22 inches in length! This strange object had been collected by Carl Ludwig Ritter von Blume from the Island of Java which is in the present day country of Indonesia. This fungus amazed the Nees von Esenbeck brothers and they noted in their Latin description “nothing attracts the eyes of men on itself more than this fungus”. They wanted to record the phenomenal collection and drew an illustration of the fungus that was life size which was a fruiting body with a 6 inch stipe, 5 inch pileus (the hand) and seven 22 inch projections (fingers). The illustration showing the

hand of the evil demon is an awesome drawing of over 30 inches in size (Figure 2). Like the fungal necklace found in 1926, this 1826 description of what the authors thought was a new species was a natural curiosity rising from the underworld and so eerie it was given the latinized Sanskrit name for evil demon hand. In Hindu mythology, in fact, *piśācas* are fierce, flesh-eating evil demons that arose from Brahmā’s anger (Doniger O’Flaherty, 1980). The finger-like growths of this polypore were thought by the Nees von Esenbeck brothers to be unique warranting a new species name. We now know these unusual growth characteristics

are under environmental control and not a sufficiently stable character to use for taxonomic purposes. These early botanists also noted in their description that this peculiar fungus bears some resemblance to a collection made in the late 1600's by Georg Eberhard Rumphius which was published in a volume of *Herbarium Amboinense* in 1750 and named *Fungus digitatus*. However, the Nees von Esenbeck brothers thought their fungus with its "huge and monstrous appendages" was different from this earlier reported collection and represented a new species.

We found the publication of *Fungus digitatus* and it contained an illustration that showed it was another *Ganoderma* fruiting body that has re-growths of finger-like projections. It was collected over 100 years earlier (in the late 1600's) than the 'hand of the evil demon' from the Ambon archipelago which is also a part of Indonesia. Surprisingly a copy of this very old book was in the University of Minnesota's Wangensteen Library rare book collection and we were able to reproduce the *Fungus digitatus* illustration for this article (Figure 3). Rumphius, whose name was originally Rumpf, was a botanist for the Dutch East India Company who studied and cataloged the flora of the Spice Islands from about 1662 until his death in 1702. His plant and fungus collections were documented posthumously in 6 large folio volumes containing descriptions of 1200 collections. *Fungus digitatus* was published in the last volume 48 years after Rumphius' death (Rumphius, 1750).

With the help of Henry Heuveling van Beek, a friend from the Netherlands who directs The Rainforest Project Foundation, we were able to get a translation of this old article written in an early style of the Dutch language. The description indicates the fungus was found on a fallen and half decayed *Calappus* tree (now called coconut palm) and the fruiting body looks like "a hand with fingers that end with white as if they were finger nails". It was considered a "strange type of genus rarely encountered". This is the earliest report that we have found so far for a *Ganoderma* with such unusual characteristics. The illustration shows a variety of different forms with some having an expanding pileus at the end



Figure 4. *Ganoderma* with re-growth at the edges of the pileus found in Georgia after flooding covered the original fruiting body. Photo by Ancil Jacques.

of a long stipe, others that look like long fingers (top of Figure 3) and those that look like hands (bottom of Figure 3). Just about once a century it seems one of these odd naturally produced objects is reported.

There have been a few other reports over the years of finger-like fruiting bodies or those that resemble hands. M. J. Berkeley reported in 1839 a fungus he named *Polyporus australis* from Van Diemen's Land (now called Tasmania) with a long stipe that looked like one big long finger and others that had an expanding pileus on a long stipe (Berkeley, 1839). Another named *Pleuropus pes-simiae* by Berkeley in 1856 was found in the upper basin of the Rio Negro in northwestern Brazil. He noted "This very strange fungus, which I find it very difficult to describe, is known to the Indians, who call it 'Coatâ-pô' or Monkey's-hand, the 'Coatâ' being a large black monkey" (Berkeley, 1856). All these reports of odd looking fruiting bodies were

thought at the time to be new species but are now considered to be in the *Ganoderma lucidum* complex. These examples are much less dramatic in form than those of the evil demon hand and *Fungus digitatus* but show there are a variety of strange fruiting bodies that can be produced by the various species of *Ganoderma lucidum*.

After the 2015 article in FUNGI magazine was published showing the witch doctor's *Ganoderma* necklace, some modern day examples were found by readers of the magazine. Ancil Jacques had been collecting fungi along the Altamaha River in Big Hammock Wildlife Management Area located in southern Georgia and found a *Ganoderma* with re-growth that he indicated "resembled the *Ganoderma* he saw in FUNGI magazine but they looked more like teeth than fingers" (Figure 4). This was found in a marsh area that had flooded. It appears that after the flooding receded, new secondary growth occurred along

Figure 5. A stipitate *Ganoderma* found on Skidaway Island, Georgia that produced new growth from the edge of the original pileus. Photo by Ancil Jacques.



the edge of the previously formed fruiting body. These new growths were rounded projections and since they were not covered and had plenty of light, they did not elongate into finger-like projections. After finding this specimen, Ancil continued his search for odd looking *Ganoderma* and a few weeks later had found another along a marsh at Skidaway Island, Georgia (Figure 5). This one showing a slender stipitate fruiting body that produced a second stipitate growth that was much like the first. A mycologist in Mexico, Jesús Pérez-Moreno, also reported that he had found a *Ganoderma lucidum* (*sensu lato*) with new stipitate fruiting bodies coming out of an old basidiocarp (Figure 6). This was found while collecting fungi in the Limoncocha Biological Reserve in the Ecuadoran Amazon. It was found adjacent to a stream near the Rio Napo that often flooded. All of these collections are great examples showing the ability of *Ganoderma* to regrow from a previously fully formed pileus. The locations where they were found suggest that an environment with flooding and excessive moisture (and likely high CO₂ concentrations) seems to be a factor to trigger the new fungal growth.

The beautiful form and color of the shiny red *Ganoderma* have always fascinated people and its use in traditional medicine adds to its intrigue and importance. In different Asian cultures, it is called the divine mushroom, spirit and soul mushroom and mushroom of immortality. However, over the past 400 years as each of the rare fingered *Ganoderma* were found, whether it was by scholars of mycology or native people, their extraordinary form instilled a more unusual connotation of evil demon hands and fingers emerging from the underworld as well as objects that had unusual (and possibly black magic) powers. Three of these (Figures 1 to 3) all came from the wet tropical forests of Indonesia (West Papua, Java and the Ambon archipelago) where the environment may promote the most extreme forms of these odd growths. However, you apparently do not need to travel to Indonesia to find strange *Ganoderma* re-growths since they can be found, although not as elaborate, where conditions are favorable. With



Figure 6. A *Ganoderma* found in the Ecuadoran Amazon at the Limoncocha Biological Reserve producing two new fruiting bodies at the edge of an older (black) basidiocarp. Photo by Jesús Pérez-Moreno.

the readers of FUNGI magazine out looking, new examples will undoubtedly be found and maybe mushroom growers producing *Ganoderma* will be inspired to someday cultivate a finely crafted version of a fingered *Ganoderma* necklace or a really creepy evil demon hand to rival the old ones recorded in the mycological historic record. We eagerly wait for such an event.

Acknowledgements

The authors thank the Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge MA 02138 for permission to publish the photograph of their historic *Ganoderma* necklace in their collection; the Wagensteen Historical Library of Biology and Medicine, University of Minnesota

for permission to reproduce the 1750 image from *Herbarium Amboinense* and to Ancil Jacques, also known as Swampy Appleseed from Georgia, and Jesús Pérez-Moreno, Colegio de Posgraduados, Montecillo México for finding the modern day examples of re-growth in *Ganoderma* and providing photographs for this publication. We also thank the University of Minnesota Digital Library Services for their help to improve the quality of the historic mycological drawings for this publication.

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