Cordyceps versus Cordyceps Hawkesii

Overview

Cordyceps is a Chinese Materia Medica (CMM) listed in Schedule 2 of the Chinese Medicine Ordinance and Chinese Pharmacopoeia (2015 Edition). On the other hand, Cordyceps Hawkesii has not been listed in either references. Cordyceps was first recorded in the literatures in Qing Dynasty, while the medicinal value of Cordyceps Hawkesii was first published in the Zhong guo yao yong bao zi zhi wu in 1982. According to the Chinese Pharmacopoeia and Zhong hua ben cao, both CMM are formed compositely of a dead caterpillar and the fungus stroma growing in the head of the larva. Both CMM can tonify the kidney and replenish the lung, and furthermore, Cordyceps can also be used for resolving phlegm, chronic cough and consumptive disease. Despite similar appearances, their functions vary and there is a large difference in their price, thus they should be used accordingly.

Source

Cordyceps is the composite consisting of the stroma of the fungus, *Cordyceps sinensis* (Berk.) Sacc. in the family Hypocreaceae, parasitized on the larva of some species of insects in the family Hepialidae, and the dead caterpillar.

Cordyceps Hawkesii is the composite consisting of the stroma of the fungus, *Cordyceps hawkesii* Gray in the family Hypocreaceae, parasitized on the larva of some species of insects in the family Hepialidae, and the dead caterpillar.
Key identification features

Macromorphological features of Cordyceps

- Formed compositely of a dead caterpillar and the fungus stroma growing in the head of the larva
- Deep yellow or yellowish-brown caterpillar resembling a silkworm
- Solitary stroma

Upper part of some stroma is slightly swollen, cylindrical and relatively long
Apex of stroma with sterile end

Reddish-brown head

With 20-30 distinct annulations. Annulation relatively thinner near the head

With 8 pairs of legs, the 4 pairs in the middle are obvious

Micro-morphological features

A: Yellowish-white abdominal leg (→) significantly protruded with yellowish-brown apex. Crochet (→) is distinct

(4 pairs of legs in the middle of caterpillar (Abdominal legs)) 500 μm

B: Located at the lateral side of caterpillar. Black and elliptical

(Spiracle of caterpillar) 200 μm
**Key identification features**

**Macroscopic features of Cordyceps Hawkesii**

- Formed compositely of a dead caterpillar and the fungus stroma growing in the head of the larva
- Deep yellow or yellowish-brown caterpillar resembling a silkworm
- Stroma is mostly solitary, occasionally with 2-4

![Image of macroscopic features](image)

**Micro-morphological features**

A: Yellowish-brown abdominal leg (→) insignificantly protruded with yellowish-brown apex. Crochet (→) is indistinct

![Image of micro-morphological features](image)
### Microscopic feature comparison of Cordyceps and Cordyceps Hawkesii powder

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cordyceps</th>
<th>Cordyceps Hawkesii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integument cell of caterpillar</td>
<td>Colourless, light yellow or yellow. Densely covered with small setae on the surface</td>
<td>Light yellow or yellow. With irregular stripes on the surface, distributed with brown dotted spots and scars between stripes</td>
</tr>
<tr>
<td>Crochet of caterpillar</td>
<td>Rarely found. Yellow or orange yellow; obtuse apex, base becomes broader gradually and sometimes slightly hooked</td>
<td>Rarely found. Yellow or orange yellow; cylindrical or club-shaped, swelling of the base indistinct</td>
</tr>
</tbody>
</table>

50 µm
# Summary

Major differences in the features between Cordyceps and Cordyceps Hawkesii:

<table>
<thead>
<tr>
<th>Macroscopic and micro-morphological features</th>
<th>Cordyceps</th>
<th>Cordyceps Hawkesii</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stroma</strong></td>
<td>Some with slightly swollen, cylindrical and relatively long upper part</td>
<td>Some with swollen and cylindrical upper part</td>
</tr>
<tr>
<td><strong>4 pairs of legs in the middle of caterpillar (Abdominal legs)</strong></td>
<td>Significantly protruded, yellowish-white</td>
<td>Insignificantly protruded, yellowish-brown</td>
</tr>
<tr>
<td><strong>Spiracle of caterpillar</strong></td>
<td>Black, elliptical</td>
<td>Brown, linear</td>
</tr>
<tr>
<td><strong>Integument cell of caterpillar</strong></td>
<td>Densely covered with small setae</td>
<td>With irregular stripes</td>
</tr>
<tr>
<td><strong>Crochet of caterpillar</strong></td>
<td>Obtuse apex, base becomes broader gradually and sometimes slightly hooked</td>
<td>Cylindrical or club-shaped, swelling of the base indistinct</td>
</tr>
</tbody>
</table>