Overview

Both Radix Isatidis and Rhizoma et Radix Baphicacanthis Cusiae are Chinese Materia Medica (CMM) listed under Schedule 2 of the Chinese Medicine Ordinance and the Chinese Pharmacopoeia (2015 Edition). According to the research by “Zhong hua ben cao”, five different kinds of CMM were documented as “Lan” in the “Ben cao gang mu” of the Ming Dynasty. One of these “Lan” which was described as “Leaves like the leaves of pak choi” refers to Isatis indigotica in the family Cruciferae, while the one recorded as “Leaves like the leaves of sow thistle...refers as ‘Ban lan’ by the community” refers to Baphicacanthus cusia in the family Acanthaceae and is the “Ban lan” used by the community. To date, the subterraneous part of Baphicacanthus cusia continues to be used by people of the southern part of China as “Ban lan gen”. The Chinese Pharmacopoeia states that both CMM exert functional effects of heat-clearing and detoxificating. While Radix Isatidis can cool the blood aspect and soothe the throat, Rhizoma et Radix Baphicacanthis Cusiae serves to cool the blood aspect and resolve macule. As the two CMM differ in functions, they should be used distinctly and in accordance with their properties.

Source

* Radix Isatidis is the dried root of Isatis indigotica Fort. in the family Cruciferae

Rhizoma et Radix Baphicacanthis Cusiae # is the dried rhizome or root of Baphicacanthus cusia (Nees) Bremek in the family Acanthaceae

Note:
# Its name in Chinese Pharmacopoeia (2015 Edition) is “Baphicacanthis Cusiae Rhizoma et Radix”.
Radix Isatidis vs Rhizoma et Radix Baphicacanthis Cusiae

Key identification features

Macroscopic features of Radix Isatidis decoction pieces

◆ Rounded transverse slice

Light greyish-yellow to brownish-yellow surface, with longitudinal wrinkles and long horizontal lenticels
Bark in yellowish-white to yellowish-brown
Wood in yellow, without pith in the centre

1 cm

◆ Slightly soft

Micro-morphological features

A: Longitudinal wrinkles
B: Long horizontal lenticels
C1: Bark in yellowish-white to yellowish-brown
C2: Wood in yellow
Macroscopic features of Rhizoma et Radix Baphicacanthis Cusiae decoction pieces

- Elliptical oblique slice

Greyish-brown or dark brown surface
Bark in bluish-grey
Wood in yellowish-white to yellow, with radial striations; without pith in the centre of the root
With pith in the centre of the rhizome

- Hard and fragile

Micro-morphological features

A1: Greyish-brown or dark brown surface
A2: Bluish-grey in the cut surface of the bark

B1: Wood in yellowish-white to yellow
B2: With pith in the centre of the rhizome
**Microscopic feature comparison of Radix Isatidis and Rhizoma et Radix Baphicacanthis Cusiae decoction pieces powder**

<table>
<thead>
<tr>
<th></th>
<th><strong>Radix Isatidis decoction pieces</strong></th>
<th><strong>Rhizoma et Radix Baphicacanthis Cusiae decoction pieces</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystolith</td>
<td>Absent</td>
<td>Frequently found, light yellow or colourless, long-elliptical or elliptical; mostly white, yellowish-white or polychromatic under the polarized light microscope</td>
</tr>
<tr>
<td>Starch granule</td>
<td>Numerous, accounted for the majority of the powder, mainly compound granule</td>
<td>Barely found, mainly compound granule, but the proportion of simple granule is higher than that of Radix Isatidis</td>
</tr>
<tr>
<td>Fibre</td>
<td><strong>Xylem fibre</strong> Barely found, yellow, mostly in bundles, with pits and pit canals; mostly yellowish-white under the polarized light microscope</td>
<td><strong>Xylem fibre</strong> Frequently found, mostly in bundles, with pits and pit canals; mostly yellowish-white under the polarized light microscope</td>
</tr>
<tr>
<td></td>
<td><strong>Phloem fibre</strong> Frequently found, mostly solitary, with thick wall; mostly bright yellow under the polarized light microscope</td>
<td></td>
</tr>
</tbody>
</table>

*a. features under bright field; b. features under polarized light*
## Summary

Major differences in the features between Radix Isatidis and Rhizoma et Radix Baphicacanthis Cusiae decoction pieces:

<table>
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<tr>
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<tbody>
<tr>
<td><strong>Macroscopic and micro-morphological features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Slightly soft</td>
<td>Hard and fragile</td>
</tr>
<tr>
<td>Colour of the bark</td>
<td>Yellowish-white to yellowish-brown</td>
<td>Bluish-grey</td>
</tr>
<tr>
<td>Pith</td>
<td>Absent</td>
<td>Root without pith; rhizome with pith</td>
</tr>
<tr>
<td><strong>Microscopic features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cystolith</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Starch granule</td>
<td>More</td>
<td>Fewer</td>
</tr>
<tr>
<td>Fibre</td>
<td>Fewer. With only one type – xylem fibre</td>
<td>More. With two types – phloem fibre and xylem fibre</td>
</tr>
</tbody>
</table>

For more information, please refer to the [Hong Kong Chinese Materia Medica Standards website](#):  
Isatidis Radix - Hong Kong Chinese Materia Medica Standards (Volume 4)  
Baphicacanthis Cusiae Rhizoma et Radix - Hong Kong Chinese Materia Medica Standards (Volume 5)
**Radix Isatidis vs Rhizoma et Radix Baphicacanthis Cusiae**

**Additional information**

**Photo of crude Radix Isatidis**
- Light greyish-yellow or light brownish-yellow surface with longitudinal wrinkles, long horizontal lenticel-like protuberances and lateral root scars
- Cylindrical and slightly twisted, 10-20 cm long and 0.5-1 cm in diameter
- Slightly large root apex, with dark green or dark brown remnants of petiole-base arranged in whorl, and dense warty protuberances
  - Compact, slightly soft, the fracture with yellowish-white bark and yellow wood
  - Slight odour, Slightly sweetish taste followed by bitter and astringent

**Photo of crude Rhizoma et Radix Baphicacanthis Cusiae**
- Sub-rounded rhizome, mostly curved and branched, 10-30 cm long and 0.1-1 cm in diameter, greyish-brown surface with fine longitudinal wrinkles
- Swollen node, bearing rootlets and remnants of stem base
- Hard and fragile, easily broken, uneven fracture, bark in bluish-grey, wood in greyish-blue to light yellowish-brown, pith in the centre
- Outer bark is easily exfoliated and appears bluish-grey
- Root vary in thickness, curved and branched, with slender, flexible and tough rootlets
  - Slight odour and weak taste

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