Introduction to Edible Fungi Resources in China: Interesting Mushrooms from the Hengduan Mountains

MU ZANG
Cryptogamic Herbarium, Kunming Institute of Botany, Academia Sinica, Kunming 650204, and Key Laboratory of Microbial Fermentation, Yunnan University, Kunming, Yunnan 650091,China.
E-mail: muzang@public.km.yn.cn

The Hengduan Mountains, located in southwestern China ca 98-105^0 L and 23-30^0 N, are characterized by lower tropical areas and alpine mountains regions. The monsoon forest and snow alpine shrubbery are distinguished in these areas, and give shelter to a surprising number of tropical and temperate mushrooms. Here is one of the richest areas of myco-resources and myco-diversity of the world. There are about 4000 taxa of the higher fungi, although the tropical fungi remain unknown for the most part, and there remain new members still to record and study in the future. The distribution patterns of mushrooms and vegetation are concentrated in activity and interact with each other.

In lower gorges, altitude ca 800 - 1200m, are usually distributed subtropical and tropical fungi. Gondwanaland members, such as the genera *Termitomyces* and *Sinotermitomyces*, are found in Pianma (片马), and in southern Yunnan, Burma, Laos and elsewhere. *Sinoboletus chenii* Zang et D. Z. Zhang (梅朋华牛肝菌) (Figure I, 3-5) is found in the monsoon forest and has no fleshy pileus or broad cylindric stipe, only a convex to expanded pileus and slender stipe. Another interesting taxon is *Tetrapyrgos atrocyanea* (Metrad.) E. Horak (Figure I, 1,2) with basidiospores that have radiate spines. It is adapted to the water currency and is usually deposited under humid fallen leaves in tropical latitudes where the Indian Ocean winds bring in adequate precipitation. However, mushroom divergency did not developed apparently until the Tethys retreated. The Himalayas' strong uplift took place during the late Neogene, and variant mushroom types developed in the different landform of the Hengduan Mountains; the plant and fungal habitations also varied and differentiated.

In the alpine evergreen *Quercus* forest (3500 - 4100m) occurs *Tricholoma zangii* Cao, Yao et Pegler (Syn. *Tricholoma quercicola* Zang) associated with *Quercus semicarpifolia* Handel- Mazzett. *Tricholoma bakamatsutake* Hongo is usually associated with *Quercus franchetii* Skan (1000 - 2200m), while *Tricholoma matsutake* (Imai et Ito) Singer is associated with the genus *Pinus* (1500 - 2000m). A detailed study of mushrooms associated with different trees has indicated that both fungi and plants operate in a given beneficial mycorrhizal relationship. *T. matsutake,* and another famous delicious edible fungus, *Thelephora ganbajun* Zang, are associated with the same trees: *Pinus yunnanensis* Franch on the Kunming plateau (1800 - 2100m), and *Pinus kesiya* Royle ex Gord. var. *langbianensis* (A. Chev.) Gaussen in Nanjian (南涧) and Simao (思茅) (800 -1000m). The Indian Ocean's humid and warm current blows north and uplifts to the alpine zone, often over 3000m and more, and Gandwanaland members, e.g. *Ganoderma tropicum* (Jungh.) Bres. occur in the Gaoligon Mountains (3200m) and *Phylloporus borneensins* Corner is found in Bijiang (碧江) (3400m).

Laurasia members have been distributed by this mountainous cold climatic pattern change, which gradually spread to high altitudes over 2500 - 4200m. Some taxa, such as *Agrocybe praecox* (Pers. : Fr.) Fayod, and *Marasmius alpinus* Singer, occur in alpine meadows (4000 - 4600m). This is an impressive example of the interdependence between vegetational and climatic change, so the Laurasia members and Gandwanaland members are often mixed and converge together within a few metres. The common mushroom, *Suillus spraguei* (Berk. et Curt.) Kuntz. (Syn. *Suillus pictus* (Peck) Smith et Thiers), distributed in North America and Eastern Asia, is always associated with the five needles pine tree. Recently, in this area, under *Pinus armandii* Mast., a new mushroom, *Suillus rubricontextus* Ding et Wen, was found in the Ailao Mountains. This fungus is distin

guished by its reddish context on exposure (Figure I, 6, 7), and is also associated with the five needles pine.

Fig 1. *Tetrapyrgas atrocyance* (Metrad) Horak 1. basidiocarps. 2. basidium and basidiospores; *Sinoboletus chenii* Zang et Zhang 3. Basidia and basidiospores. 4. Pleurocystidum 5. Basidiocarps: *Suillus rubrconyextus* Ding et Wen. 6. basidiocaps, 7. basidium & basidiospores