

Ecological and Taxonomical Observations on „Kou Mo“ (Northern Chinese Mushroom)

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Abstract. — In the markets of northern China the so-called “Kou Mo” mushrooms are put on sale. It is demonstrated that samples of “Kou Mo” represent one species but can also be a mixture of at least 7 different mushrooms belonging to several families. Ecology, geographic distribution and taxonomy of “Kou Mo” mushrooms are discussed.

Changchiakou City (Hopei Province) is China's market centre for the sale of “Kou Mo” mushrooms (“Kou Mo” means in Chinese: „Mushrooms from Changchiakou”!).

There are different brands of “Kou Mo” ranging in quality from pure samples of *Tricholoma mongolicum* IMAI to obscure mixtures of several agarics. It must be emphasized, however, that all “Kou Mo” mushrooms are exclusively collected in one and the same large region (1000 by 400 km) which spreads from northern China (1. Hopei Prov.: Changpei, Kuyuan, Kangpao, Shangyi Counties in the Changchiakou Prefecture, — 2. Heilungkiang Prov.: Hailar City and neighbourhood and — 3. Liaoning Prov.: W of Chihfeng City) to the Inner Mongolia Autonomous Region (Huhehot City).

The White Mushroom (*Tricholoma mongolicum* IMAI) is regarded as the best quality of “Kou Mo”. Its area of distribution is restricted to a rather small region (75 × 35 km) which geographically belongs not only to the Inner Mongolia Autonomous Region (Abaga, Silinghol) but also to the Kuyuan and Kangpo Counties, Hopei Province, China.

The localities where “Kou Mo” is usually collected are situated between 600 and 1800 m a. s. l. The mushrooms grow in pastures on humus-rich soil of different edaphic types. The precipitation in this central production area totals (in June, July and August) about 60–70% of the annual rainfall which coincides with the growing season of “Kou Mo”, lasting from early July to mid-September. The mean temperature for the period mid-July to late August is reported to be 14–16° C whereby the daily temperature fluctuations are much

more pronounced. During the summer period the relative air humidity is about 70% and the moisture content of the soil can vary between 63—74%. These natural climatic conditions are most suitable for the growth and development of the “Kou Mo” whose total annual yield can reach about 200.000 kgs (data from Bureau of Commercial Collection).

Among all kinds of mushrooms sold as “Kou Mo” the White Mushroom is recognized as the king for its special flavour is not matched by any other edible mushrooms. According to the market classification of “Kou Mo” the White Mushroom is followed by the Pearl Mushroom (locally called the “juvenile Kou Mo”), which is in fact the button stage of the White Mushroom. Its unopened pileus reaches not more than 2 cm. In third position is St. George’s Mushroom whose taste is slightly inferior to the one of the White Mushroom. Next is the Thunder Mushroom whose fruitingbodies are the largest in „Kou Mo“ mushroom mixtures. This fungus is locally known as „blue legs“. The Black Mushrooms — also called the “varied mushrooms” — are considered to belong to the least valuable class which mainly consists of Horse Mushroom, Field Mushroom, Small Mushroom and Meadow Mushroom. Occasionally in samples of “Kou Mo” small quantities of *Lepiota* sp., *Pholiota* sp., *Cortinarius* sp., *Hygrophorus* sp., *Marasmius* sp. or *Paxillus* sp. can be observed.

The seven principal species of “Kou Mo” are as follows:

1. *Tricholoma mongolicum* IMAI (White Mushroom)

Pileus 5—12 cm, hemispherical, explanate when mature, white, glabrous, margin incurved when young. Context white, thick, compact. Lamellae white, dense, sinuate. Stipe 3.5—6×1.5—3.5 cm, slightly swollen at base, white, solid, single to cespitose. Spore print white. Spores 6—8×3—4 μm, oblong-ellipsoid, hyaline, smooth. Brown to yellowish sclerotia of irregular shape in soil.

2. *Calocybe gambosa* (FR.) DONK (St. George’s Mushroom)

Pileus 6—11 cm, hemispherical to applanate, glabrous, white to light persimmon. Context white, thick, compact. Lamellae sinuate, dense, narrow. Stipe 3.5—5.5×1.5—3.5 cm, tapering towards base, white, solid, single or cespitose. Spore print white. Spores 5—6×2.5—3 μm, oblong-ellipsoid, smooth, hyaline. Brown to yellowish, irregularly shaped sclerotia in soil.

3. *Leucopaxillus giganteus* (FR.) SINGER (Thunder Mushroom)

Pileus 7—25 (rarely up to 30) cm, convex becoming explanate, later concave at the centre, finally broadly infundibuliform, glabrous, whitish to brass yellow or hazel brown, margin incurved at first, later gradually expanded. Context white, compact, thick. Lamellae subdecurrent, dense, rather narrow. Stipe 5—12 (rarely up to 15)×

2–5 cm, tapering upward, base swollen, glabrous, whitish to brass yellow, solid, single or cespitose. Spore print white. Spores 7–8 × 5–6 μm, ellipsoid, smooth, hyaline. Also forming in the soil brown to yellowish, irregular sclerotia.

4. *Agaricus arvensis* FR. (Horse Mushroom)

Pileus 5–20 cm, convex becoming explanate, whitish, dry, smooth. Context white, thick. Lamellae free, dense, white at first gradually changing to pink, finally dark brown. Stipe 4–12 × 1.5–3 cm, tapering above, base slightly swollen, white, solid. Annulus membranous, double. Spore print purplish brown. Spores 6.5–9.5 × 5.7–6.6 μm, ellipsoid, purplish brown, smooth. Cheilocystidia present.

5. *Agaricus campester* FR. (Field Mushroom)

Pileus 5–12 cm, globose at first, later hemispherical, finally convex to applanate, glabrous, silky, sometimes more or less broken into small, deltoid scales, usually white, sometimes light brown. Context white. Lamellae free, dense, white when young, gradually changing to pink and finally dark brown, purplish brown or even black. Stipe 7–9 × 1.5–2.5 cm, solid, white. Annulus membranous, fragile. Spore print purplish brown. Spores 6–8 × 4–5 μm, ellipsoid, purplish brown.

6. *Agaricus micromegethus* PECK

Pileus 2–6 cm, convex to explanate, surface silky or with hairy scales, pale grey to whitish, brown at centre. Context white, becoming dark brown. Stipe 2–5 × 0.6–0.7 cm, cylindrical or tapering above, sometimes base swollen, white, hollow in aged specimens. Annulus superior, white, membranous, not persistent. Spore print purplish brown. Spores 4.5–6.4 × 3.5–4.5 μm, ellipsoid, smooth, dark purplish brown.

7. *Agaricus pratensis* FR.

Pileus 4–9 cm, hemispherical becoming applanate, greyish white to pallid, surface covered with prostrate scales. Lamellae free, moderately dense, white at first, changing to dark brown. Stipe 4–8 × 1–1.5 cm, base slightly swollen, white or concolorous with pileus. Annulus simple, white, thick. Spore print pure brown. Spores 6.5–9 × 5 μm, elliptical smooth, brown.

Tricholoma mongolicum, *Calocybe gambosa*, *Leucopaxillus giganteus*, *Agaricus arvensis* and *A. campester* are reported to grow in „fairy rings” (Liesegang phenomenon). Since local people live since generations in the area, they actually know very well which kinds of mushrooms are associated with each particular fairy ring. With the beginning of the collecting season people work at night with a lantern to spot the most precious Pearl Mushroom. This is the reason why

not experienced outsiders will never get this particular stage of the White Mushroom.

The fairy rings of the "Kou Mo" usually have a diameter of about 30 m but large ones can reach even 60 m. Supposed the mycelium in the soil is radially spreading for 10 to 15 cm per year, a fairy ring of 60 m of diameter could be active since 500—600 years. Usually fairy rings are circular and they can be often seen clearly from a distance of 2 to 3 km. Theoretically fairy rings can spread regularly into all directions. However when fairy rings are disturbed they continue to grow in irregular bands whereas the longest bands or sections observed may reach more than 1 km. The actual progressing front of a fairy ring measures 0.5 to 1 m. The fruitingbodies of the mushrooms are produced along this outer rim. The sclerotia, if present, are also found in that part of the fairy ring (up to 20 cm wide) and are burried about 30 cm in the soil.

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