

## Agaricus Studies, VIII. (Basidiomycetes, Agaricaceae)

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**Abstract** — Two new statuses: *Agaricus macrosporus* (MOELL. et SCHFF.) PILÁT ssp. *excellens* (MOELL.) stat. n., *A. floccipes* (MOELL.) BOHUS emend. BOHUS stat. n. Further discussion on *A. pampeanus* SPEG., *A. nivescens* (MOELL.) MOELL. and *A. osecanus* PILÁT is given. With 3 figures.

**Agaricus macrosporus** (MOELL. et SCHFF.) PILÁT ssp. **excellens** (MOELL.) stat. n.

Syn. *A. excellens* (MOELL.) MOELL., Danish Psalliota Species, 1951, p. 178.

Concerning its microscopic characters, *A. excellens* does not differ from *A. macrosporus*, the difference is apparent only macroscopically owing to its relatively more slender habit, and, besides this, it occurs in woods. In some cases it does not differ even macroscopically: thus, if we examine the photographs of *A. macrosporus* published by PILÁT (1953), we shall find that there are also specimens with characters of *A. excellens* among them, which is indicated by the characterization related to the stem in the description given on the basis of the collected material: "ca diametri pilei aequilongus". (MOELLER, 1951, said when describing *A. excellens* that the pileus was 10–15 cm, while the stem 10–14 cm long.) *A. macrosporus* specimens of even longer stem than this were gathered in one of the pastures of Hungary (Szil, Com. Győr-Sopron, 21 Sept. 1975, leg. SZILI). The maximum measure found here was as follows: pileus 17 cm, stem 20×3 cm. RICKEN's (1910–1915, s. n. *Psalliota augusta*) fungus is interesting. It was found in a pine forest, in accumulated pine needles. MOELLER considered it *A. excellens*, because of its habitat, although its measures correspond to those of *A. macrosporus*: pileus 25 cm, stem 12 cm long and 6 cm thick. A further difference between the two species, according to MOELLER, was the fully white colour of the *A. excellens* pileus; this, however, occurs also with *A. macrosporus*, when it grows in cloudy weather.

The ecological difference evident only in habitat does not justify the categorization of *A. excellens* as an independent species.

### DATA TO THE KNOWLEDGE OF THE CAMPESTER-GROUP

#### *Agaricus pampeanus* SPEG.

HEINEMANN (1962, 1965) thoroughly dealt with this species, which — according to his statement — is widespread in Argentina. The material of a gathering in Morocco (Témara sur la côte entre Rabat et Casablanca) also proved to be this species. It is likewise widespread in the saline pastures of Hortobágy in Hungary; in one occasion (16–17 Nov. 1966), it grew in such a huge quantity that the grasslands looked white. HEINEMANN saw two gatherings from Hortobágy and he informed us about his opinion in his letter as follows: "Je pense que les deux récoltes peuvent être rattachées *A. pampeanus* SPEG.". Hereby I express my sincere gratitude for his kind examination.

HEINEMANN (1965) makes an interesting statement on this species: "*A. campester* s. str. est une espèce mésophile préférant les prairies pâturées établies sur sol frais ou peu sec (*Lolieto-Cynosuretum* notamment). Dans les formations herbeuses sur sol plus sec il existe des espèces voisines — dont probablement, *A. pampeanus* — qui ont généralement été confondues avec *A. campester* dont elles semblent ne différer que par un petit nombre de caractères quantitatifs." This view is justified by the ecological conditions prevailing in the habitat of *A. pampeanus* in Hungary. Here the association is *Festucetum pseudovinae*. Its occurrence along the coasts of Morocco is also remarkable. In the saline pastures of Hortobágy, there are several other coastal *Agaricus* species occurring besides *A. pampeanus* such as *A. bernardii*.

It can be distinguished from *A. campester* by the following features: Spores large (at the type:  $8.5-10 \times 5.5-7 \mu\text{m}$ , at our gatherings:  $8-10 \times 5.5-7 \mu\text{m}$ ); apical pore mostly evident, not rarely fish-mouth like; often enough there are numerous spores with abnormal measure and shape. It is difficult to find characteristics belonging to macroscopical features; the only remarkable thing is that *A. pampeanus* is somewhat more squat. This can be shown by the fact that in specimens with wide pileus the stem is relatively short — 6 : 2, 8 : 2.5, 8 : 3, 9 : 4, 11 : 4 cm. As for the rest: pileus whitish or later a little brownish too, more or less innato-fibrillose, fibrillose-squamulose or squamose.

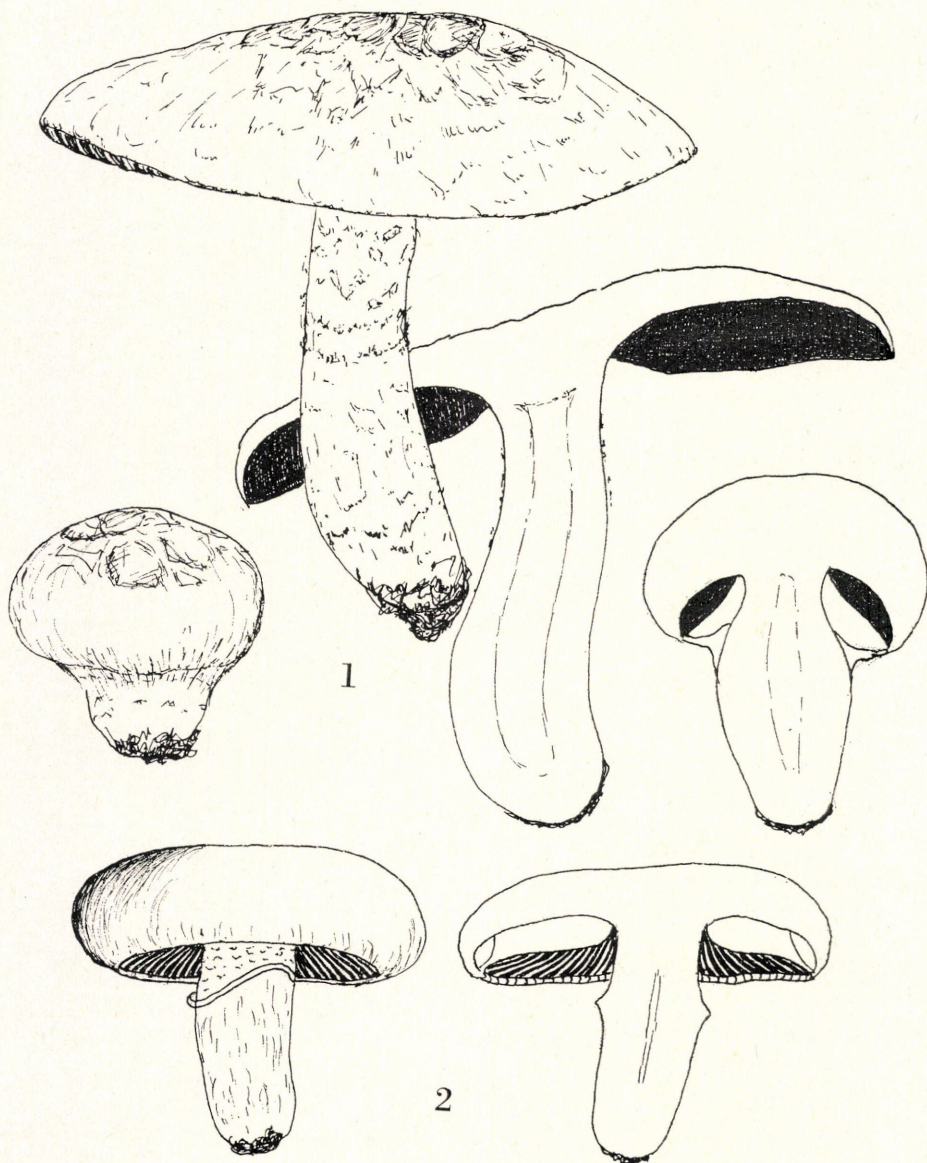


Fig. 1. *Agaricus floccipes* (type material, natural size). — Fig. 2. *Psalliota campestris* var. *floccipes* after MOELLER (1950) (natural size)

**Herbarial data:** 1. Hortobágy: Kónya, saline pasture, 17 Nov. 1966, leg. BOHUS et VÉSSEY; 22 May 1974, 18 Sept. 1975, 9 Nov. 1976, leg. BABOS. — 2. Hortobágy: Nyárijárás, saline pasture, 6 June 1975, 14. Sept. 1976, leg. BABOS et FRIESZ. — 3. Hortobágy: Újszentmargita, saline pasture, 2 June 1976, leg. BABOS; 6 Oct. 1976, leg. BABOS, GRÚSZ et RIMÓCZI. — 4. Hortobágy: Nagyván, saline pasture, Oct. 1974, leg. SZABÓ; 9 Sept. 1976, leg. KOMÁROMY. — 5. Hortobágy: between Kaparó-csárda and Nagyván, saline pasture, 2. June 1976, leg. BABOS; 14 Sept. 1976, leg. BABOS et FRIESZ. — 6. Hortobágy: Hagymás, saline pasture, 6 Oct. 1976, leg. BABOS, GRÚSZ et RIMÓCZI. — 7. Gödöllő, grassy place, 23 Oct. 1966, leg. TÓTH.

**Agaricus campester (L.) FR. var. equestris MOELL**

The characteristic yellow colouring is of different extent: (1) it is already in the habitat that the untouched fruit body is sometimes remarkably yellow, while on other occasions it is  $\pm$  yellow (such is s. n. *Psalliota campestris* var. *isabellina* in Fig. 28/I. of ESSETTE 1964); or, (2) it is turning yellow at touching; or, (3) the yellowish colour appears only during drying. Even on these occasions, the small spores of the fungus, which is still white while fresh, is an indication of the fact that the species belongs to this taxon.

**Herbarial data:** 1. Nadap, meadow, May 1951, leg. BOHUS. — 2. Mts. Börzsöny: near Királyrét, grassy place, 22 July 1957, leg. SZUKÓ-LACZA. — 3. Mts. Zempléni: near rivulet Kemence, meadow, 2 Sept. 1958, leg. BABOS et BOHUS. — 4. Mts. Pilis: near Budakalász, pasture, 11 Nov. 1966, leg. BABOS, BOHUS et VÉSSEY. — 5. Mts. Mátra: near Parádsasvár, pasture, 19 Sept. 1967, leg. BABOS et BOHUS; 27 Sept. 1967, 25 Sept. 1968, 2 Sept. 1969, leg. BABOS, BOHUS et VÉSSEY. — 6. Kölesd, pasture, 2 Oct. 1972, leg. BABOS, BOHUS et IMREH. — 7. Hortobágy: near village Hortobágy, pasture, 3 Sept. 1970, leg. BABOS et VÉSSEY. — 8. Hortobágy: Kónya, saline pasture, 18 Sept. 1975, leg. BABOS. — 9. Hortobágy: Nyárijárás, saline pasture, 14 Sept. 1976, leg. BABOS et FRIESZ. — 10. Hortobágy: Egyek-Ohat, saline pasture, 27 May 1974, leg. BABOS. — 11. Hortobágy: Újszentmargita, saline pasture, 6 Oct. 1976, leg. BABOS, GRÚSZ et RIMÓCZI. — 12. Hortobágy: Hagymás, saline pasture, 14 Sept. 1976, leg. BABOS et FRIESZ; 6 Oct. 1976, leg. BABOS, GRÚSZ et RIMÓCZI. — 13. Hortobágy: between Kaparó-csárda and Nagyván, saline pasture, 14 Sept. 1976, leg. BABOS et FRIESZ.

**Agaricus campester (L.) FR. var. squamulosus REA**

Pileus breaking up into ochreous brownish, brownish or brown squamules or squames. Diameter of pileus according to MOELLER (1950) 3–4 cm, at PILÁT (1953) 4–8 cm and in our material up to 12 cm. Spores bigger than in the type: according to MOELLER 7–8 $\times$ 5–5.5  $\mu$ m, at PILÁT 8.3 $\times$ 5.5  $\mu$ m and in the Hungarian material 7–9 $\times$ 4.8–6.3  $\mu$ m. Not rarely the exsiccata yellowish, yellow or rusty yellow.

**Herbarial data:** 1. Mts. Zempléni: near village Pálháza, pasture, 16 Sept. 1957, leg. BABOS et BOHUS. — 2. Nagydorog, pasture, 1 Aug. 1966, leg. BABOS, BOHUS, IMREH et VÉSSEY; 12 Aug. 1968, leg. FERENCZ et VÉSSEY; 30 Aug. 1969, leg. BABOS, BOHUS et IMREH. — 3. Pétervársára, 28 Aug. 1969, leg. BABOS. — 4. Szil, meadow, 30 Sept. 1973, leg. SZILI. — 5. Hortobágy: Kónya, saline pasture, 15 Nov. 1967, leg. ÓRI; 11 Nov. 1971, leg. SZÜCS. — 6. Szalkszentmárton, saline pasture, 15 May 1974, leg. BABOS et BOHUS.

**Agaricus floccipes (MOELL.) BOHUS emend. BOHUS stat. n. (Figs. 1–3)**

**Syn.** *A. campestris* (L.) FR. var. *floccipes* MOELLER, FRIESIA, 1950, 4: 57–58.

In studying the material selected from two gatherings (2 kg and 5 kg) of different localities, it was concluded that var. *floccipes* of *A. campester* should be raised to specific level: (1) Because of the well-developed velum universale, the young fungi are similar to the young specimens of *Edulis*, i. e. they are of a *Lycoperdon* appearance. (2) Margin of pileus in the young specimens with a more or less sulcate-striate edge on the underside exceeding the gills as at the species of *Edulis*-group. (This is visible in MOELLER's figure, 1950, p. 58; see also Fig. 2.) (3) The flocci, observable later in the upper part of the stem, originate from the velum parziale which is of a very loose tissue. Because of the loose structure, the ring is very small, and often absent. The velum universale is also loose, its remnants are the flocci and scales occurring in the lower part of the stem, also in zones. Therefore stem is not rare like that of *Hebeloma sinapizans*. (4) Smell is anis-like unusual in the *Campester*-group. (5) Fruit body is oft larger and flesh thicker than in *A. campester*. (6) Pileus turning more or less lemon yellow when touched.

The habitat is mainly in meadows-pastures, but the species also occurs in forests neighbouring pastures, under *Robinia*, *Acer* and *Fraxinus*.

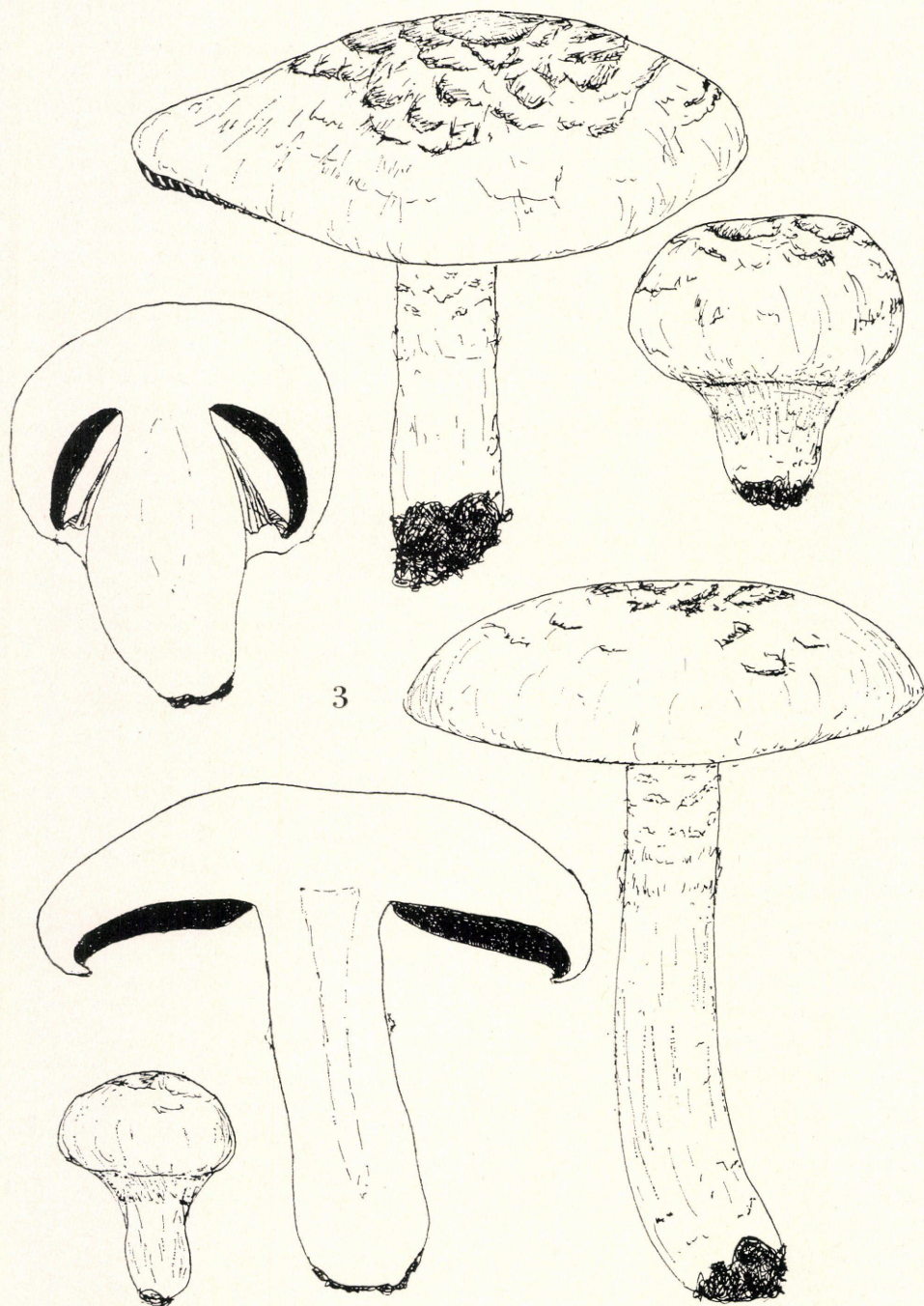


Fig. 3. *Agaricus floccipes* from Tóserdő (natural size)

Carpophorus primo lycoperdoniformis. Pileus 5–11–(13) cm latus, 1.2–1.6 cm crassus, e globoso vel hemisphaerico-convexo-explanatus, albus, albidus, tactu ± citrinoflavescens, glaber vel late (non raro crassiore) semper rhombiforme diffracto-squamulosus, margine (cuticula + velum) lamellas ad 4 mm excedente et intus non raro striato. Lamellae 5–10–(12) mm latae, primitus pallidae vel pallide roseae, deinde vivide roseae, demum nigrobrunneae. Stipes 4–7 (rarius 8–10) cm longus, 1.4–2.2–(2.5) cm crassus, basi attenuatus vel non, in statu juvenili velo universali — structurae floccoso-gossypino — obtectus, deinde toto floccosus-squamulosus, etiam in zonis sicut apud *Hebeloma sinapizans*. Velum parziale in flocculos diffractum. Annulus parvus et debilis, semper absens. Caro sat crassa, alba, fracta moderate erubescens; reactio Schaefferi negativa. Odor aniseus, evanescent. Sporae ellipsoideae-ovoideae, 6–7.2–(7.5) × 4.5–5.2 μm. Cystidia marginalia nulla. Fibrillae veli universalis structurae laxae; cellulae earum usque ad 150 μm longae et 18 μm latae.

Habitatio: in campis pascuisque etiam subhumidis.

T y p u s : 56.937 in Herbario Musei Historico-Naturalis Hungarici, Budapest. Inter Kopháza et Nagycenk, in prato subhumido, 26 Oct. 1977, leg. BABOS, BOHUS, GERZSON, GRÚSZ et RIMÓCZI.

F u r t h e r h e r b a r i a l d a t a : Tóserdő, subhumid pasture and forest (*Robinia*, *Acer*, *Fraxinus*), 2 Oct. 1977, leg. KONECSNI.

KEY TO *AGARICUS PAMPEANUS*, *FLOCCIPES*, *CAMPESTER*  
AND ITS VARIETIES

1. Spores large: 8–10 × 5.5–7 μm, with apical pore
  - Spores shorter, without apical pore ..... 2
2. Spores small: 6–7.5 × 4–5 μm. Pileus more or less yellowing ..... 3
  - Spores medium ..... 4
3. Stem above ring floccose-squamulose like *Hebeloma*; 1.4–2.2–(2.5) cm thick
  - ..... **A. floccipes** (MOELL.) BOHUS emend. BOHUS
  - Stem above ring smooth; thinner
    - ..... **A. campester** (L.) FR. var. **equestris** MOELL.
4. Spores 7–8 × 4–5 μm ..... 5
  - Spores bigger: 7–9 × 5–6.3 μm ..... 6
5. Pileus white, smooth or densely floccose-squamulose
  - ..... **A. campester** (L.) FR.
  - Pileus argillaceous, with darker squamules
    - ..... **A. campester** (L.) FR. var. **isabellinus** MOELL.
6. Pileus with dark brown fibrils. Stem stout, rather tall: 5–8 × 1–2 cm
  - ..... **A. campester** (L.) FR. var. **fusco-pilosellus** MOELL.
  - Pileus with squamules or squames .....
    - ..... **A. campester** (L.) FR. var. **squamulosus** REA

**Agaricus nivescens** (MOELL.) MOELL. and **A. osecanus** PILÁT

There was problem to identify *A. nivescens*, although the material at our disposal was very rich. Owing to the wide ovoid spores of smaller size ([5.5]–6–7 × 4.4–5 μm), and low stature, refer our material enumerated below to *nivescens* against the rather slender, large-spored *A. arvensis*.

P r o b l e m s : (1) In MOELLER'S (1951) description the stem is very thick: 35–50 mm, although, admittedly, it is already only 15 mm in var. *parkensis* MOELL. The stem sizes of our material: 5–10 × 1–2.5 cm, rather corresponding with those of HEINEMANN (1965): 6–9 × 2–2.5 cm. (2) The colours of lamellae in MOELLER: "dein dilute incarnatae", in HEINEMANN: "blanchâtres puis rosées", in our gatherings rose in two specimens, in many specimens for some time whitish, then flesh coloured greyish or cream-greyish. In this respect, our material is more in agreement with *A. osecanus* PILÁT, where the colour of the young lamellae is "greyish, then greyish flesh ... never vividly rose".

If, for *A. nivescens*, which is reported from several habitats in western Europe and North Africa, it turns out — on the basis of further gatherings there — that the transitional colour of the lamellae is not exclusively rose, then the name *nivescens* becomes a synonym. As early as in 1952, KONRAD &

MAUBLANC said: "L'*Ag. osecanus* PILÁT n'en semble pas distinct (nom qui aurait la priorité)". Consequently *A. nivescens* will have to be treated as a synonym of *A. osecanus*.

**Herbarial data:** 1. Hortobágy: Kónya, saline pasture, 22 Sept. 1967, leg. TÓTH. — 2. Hortobágy: near Ohat, grassy places, 27 May 1974, leg. BABOS; locust-tree forest, 24 June 1974, leg. BABOS. — 3. Hortobágy: Újszentmargita, pasture, 6 Oct. 1976, leg. BABOS, GRÚSZ et RIMÓCZI. — 4. Hortobágy: Vajdalahosi erdő, margin of wood, 3 Sept. 1975, leg. BEGITTER, KOVÁTS et SZUJKÓ-LACZA. — 5. Hortobágy: Nagyvíván, "Betyárpáskom", saline pasture, 23 May 1974, leg. BEGITTER. — 6. Hortobágy: between Nagyvíván and Kaparó-csárda, saline pasture, 14 Sept. 1976, leg. BABOS et FRIESZ.

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