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ALBERT PILÁT:

ČESKÉ DRUHY ŽAMPIONŮ (AGARICUS).

THE BOHEMIAN SPECIES OF THE GENUS AGARICUS.

PRAHA 1951

NÁKLADEM NÁRODNÍHO MUSEA V PRAZE

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České druhy žampionů (Agaricus).

The Bohemian Species of the Genus Agaricus.

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Tato práce jest výsledkem studia, které jsem věnoval v posledních letech, ale hlavně v roce 1950, rodu *Agaricus*. Ovšem o české žampiony zajímal jsem se celá dvě minulá desetiletí a nashromáždil jsem obsáhlý dokladový materiál k tomuto rodu v herbáři Národního musea v Praze, a to jak vlastními sběry, tak výměnou s cizími badateli. Tohoto materiálu jsem také použil. Přes to však tato práce daleko není vyčerpávající a také ne monografií českých druhů, nýbrž jen příspěvkem k jejich poznání. Při této příležitosti rekapituloval jsem pokud možno všecky dosavadní poznatky o českých druzích a snažil jsem se uspořádati je přehledně.

Rok 1950 byl mimořádně příznivý růstu žampionů, nebo alespoň se mi tak zdálo, neboť všímal jsem si jich mnohem více, než v jiných letech.

Rod *Agaricus*, ač obsahuje převážně veliké, masité a hospodářsky důležité druhy, jest přes to jedním z nejméně známých rodů mezi všemi houbami. Obsahuje značný počet druhů, mnohem větší, než dosud jest známo a popsáno. Mnohé druhy rozeznávají se nesnadno, neboť jsou blízce příbuzné a znaky, jimiž se rozlišují, nejsou zvlášť nápadné. Na žampiony musíme se nejdříve naučit dívat a teprve pak je možno studovat. Málo známé jsou dokonce i druhy, které se pěstují uměle. Pěstované druhy bývají v literatuře většinou označovány jako Agaricus campester, respective kulturní rasy, které pěstováním vznikly z tohoto druhu. To však není pravda. Agaricus campester, pokud se mi dostal materiál do rukou, se nepěstuje a myslím, že by se pěstoval špatně, protože to není houba vysloveně koprofilní, jako dva bisporické druhy, které se hlavně pěstují: Agaricus hortensis Cooke a Agaricus bisporus Lange.

Tyto dva žampiony nejsou žádné odrůdy, nýbrž dobré druhy, které nevznikly kulturou, nýbrž rostou divoce a z přírody byly do kultury převzaty. Že plodnice jejich vypěstované ve tmě, za jiných okolností tepelných a vlhkostních, vypadají někdy trochu jinak, jest pochopitelné. Vzácně v Evropě i v Americe pěstuje se také Ag. villaticus Brond.

Výzkum evropských druhů rodu *Agaricus* jest teprve na počátku. To, co jest známo, jest známo velmi nedokonale a fragmentárně. Proto také jména, kterými označuji jednotlivé druhy nutno považovati za provisorní.

Přehled českých a středoevropských druhů.

1a Dužnina za čerstva (hlavně u mladších plodnic) na řezu slabě červená, pak barví se rezavě nebo se skoro nemění. *(Rufescentes)* 2

1b Dužnina čerstvých mladých plodnic zbarvuje se se na řezu intensivně vínově či karmínově červeně. *(Sanguinolentae)* 9

1c Dužnina na řezu zbarvuje se žlutě, alespoň po delší době a hlavně ve spodní části třeně. *(Flaventes)* 14

1d Dužnina bledá, při povrchu třeně purpurově červená, na vzduchu však celkem barvu neměnící. Lupeny tmavě purpurově červené, pak hnědé až skoro černé. Výtrusy 4—5 × 2—2 µ, dlouho bledé, pak žlutohnědé, mnohem světlejší než u ostatních druhů rodu Agaricus. Prach výtrusný kouřový, někdy se slabým odstínem purpurovým. *(Melanophyllum* Vel.) Klobouk 1,5—3 cm, hlínově hnědý až černavý. Voní po okurkách.
1. Agaricus haematospermus FR. ex BULL.

2a Klobouk alespoň v mládí bílý 3

2b Klobouk ani v mládí, ani později není bílý, nýbrž zbarvený, většinou hnědě 7

3a Velum universale není nápadně vyvinuto a nepřirůstá k basi jako souvislá punčoška (ochrea) 4

3b Velum universale jest silně a nápadně vyvinuto; v mládí obaluje souvisle celou plodnici, takže tato vypadá jako Lycoperdon, později zanechává na spodu třeně přirostlou punčošku, která na hořejším okraji jest jako lem trochu ohrnuta. Výtrusy 4—6 × 4—5 µ.
2. Agaricus edulis (VITT.) MOELL. et SCHAEFF.

4a Klobouk veliký, 12—20 cm v prům., hladký či rozpukaný. Dužnina páchne nepříjemně 5

4b Klobouk menší, 5—15 cm v pr. Dužnina voní příjemně . . 6

5a Klobouk v dospělosti, hlavně za sucha, rozpukaný. Výtrusy podle QUÉLETA skoro kulaté, 8 µ. Podle REA-Y 9—11 × 5,5—6,5 µ. Výtrusy podle MOELLERA (1950): vejčitě okrouhlé, s velikou kapkou, 5,5—7(10) × 5—6 µ. Dosud špatně známý druh.
3. Agaricus Bernardi (QUÉL.) SACC.-non RICKEN!

5b Klobouk hladký. Výtrusy 8—11 × 5,5—6,5 µ. Podobá se macrosporus J. Schaeff., ale dužnina nežloutne a páchne po koňské moči. Jest patrně totožný s Ag. Bernardi Quél.
Agaricus urinascens J. SCHAEFF. et MOELL.

5c Klobouk radiálně vločkatě šupinkatý, 6—10 cm. Šupiny tenké. Netvoří čarodějné kruhy. Na holé zemi pod listnatými nebo jehličnatými stromy (tis, smrk atd.). Dužnina bílá, na řezu živě růžová. Páchne nepříjemně rybinou. Výtrusy kulovité, s velikou kapkou, 5,5—7(8) × 4,5—5,5(6) µ. Cystidy 30—64 × 6—20 µ. Jest příbuzný nebo totožný s *Agaricus algodorus* ING. et RDB. (Ingelström, Svampflora p. 105, 1940), který páchne jako mořské řasy a dužnina v celé plodnici zbarvuje se posléze šedavě lososově. (Psalliota ingrata, Moeller, Friesia 4:17, fig. 5, t. VIII.)
Agaricus ingratus (MOELLER).

6a Basidie tetrasporické. Mladý klobouk — pokud jest uzavřen — jest více méně kulovitý, v mládí hladký, později skoro vždy za suššího počasí radiálně až šupinatě hluboce rozpukaný. Výtrusy 7—10 × 5—6 µ. Na lukách a v příkopech u cest mezi travou, řídčeji na jiných místech. Nepěstuje se.
4. Agaricus campester FR. et L.

6b Basidie bisporické. Mladý klobouk, pokud jest uzavřen, ale i později na temeni široce plochý, v mládí hladký a bílý brzo však uprostřed špinavě šedohnědavý, k okraji rozpraskaný ve velice jemné, vláknité šupinky. Výtrusy širší, 7—8,3 × 5—5,5 µ. Koprofilní druh, rostoucí na holé zemi, silně, hlavně močí, vyhnojené. Pěstuje se na slamnatém hnoji. V přírodě roztroušeně, hlavně v zahradách na holých místech močí a trusem zvířat prosáklých. *5. Agaricus hortensis* (COOKE) PILÁT.

6c Basidie tetrasporické. Klobouk jen 2,5—3,5 cm, bílý, pak trochu nažloutlý. Drobná houba, rostoucí mezi travou, která vypadá jako miniaturní Agaricus campester. Výtrusy krátce vejčité, 4,5 až 5 × 3—3,5 µ. Viz 28a. *28. Agaricus rusiophyllus* LASCH.

6d Basidie čtyřvýtrusé. Klobouk bělavý s šedavě červenavým odstínem, často pomačkáním žloutnoucí, 5—8 cm v pr., s hnědavými, přitisklými, širokými, ale často chybějícími šupinami, za sucha s popraskanou pokožkou. Okraj klobouku neryhovaný. Lupeny světle masové, posléze hnědočerné. Třeň skoro vřetenitý, tlustý a krátký, 3—5 × 2—3 cm, jako klobouk zbarvený, hladký. Prsten blanitý, shora upevněný. Dužnina tlustá, bílá, na lomu šedočervená. Výtrusy kulovité, 5—7 × 4—5,5 µ. Cystidy úzce kyjovité až válcovité, 18—32(60) × 3—7(9) µ. Voní slabě, příjemně, trochu mandlově, v houfech na lukách v Dánsku. (Psalliota spissa Moeller, Friesia 4:43, t. IIIb, 1950).)
Agaricus spissus (MOELLER).

6e Basidie čtyřvýtrusé. Druhy ze skupiny „campestris" ve smyslu Moellerově (Danish Psalliota Species, Friesia 4:44, 1950). Cystidy nejsou na ostří lupenů zřetelně vyvinuty, ostří jest

porostlé četnými buňkami téže podoby a velikosti, jako jsou basidie, a rovněž plodnými basidiemi. Lupeny proto živě růžově masové, podobně jako u Ag. campester. Klobouk bílý až hnědý, vláknitý či šupinkatý. Prsten upevněn jest velice krátce shora a jest tenký a křehký 28

7a Basidie bisporické. Klobouk 4—8(10) cm v pr., špinavě hnědavý až sytě tmavohnědý, i v mládí na temeni plochý, s pokožkou na temeni hladkou, k okraji většinou lesklou a radiálně vláknitou až široce šupinatě rozpukanou. Na holé půdě na hnojených místech, na polích, kompostech, řídčeji v lesích. Pěstuje se uměle. Výtrusy široce vejčité, 6,5—7,5(10) × 5—6(7) µ.
6. Agaricus bisporus (LANGE).

7b Basidie tetrasporické 8

8a Klobouk 6—8 cm v pr., s pokožkou plstnatě vláknitou, hnědou, k okraji světlejší. Výtrusy široce vejčité, 6,5 × 4 µ. Jest to patrně tetrasporická rasa od Ag. bisporus Lange. Zřídka v lesích i mimo les. *7. Agaricus subfloccosus* LANGE.

8b Klobouk statnější, až 20 cm v pr., tlustě a tvrdě masitý, pokrytý tmavohnědými, vláknitými a velikými, přitisklými šupinami. Třeň tlustý, opatřený nápadně tlustým a tuhým prstenem. Pod prstenem bývají kroužkovité či páskovité zbytky universálního vela. Výtrusy 6,5—8 × 5—6 µ, skoro kulaté. Na rumištích, hlavně v městech, ale i na okrajích cest a v zahradách. *8. Agaricus villaticus* BROND.

9a Klobouk čistě bílý, dosti brzo v prostředně veliké a přitisklé šupinky roztrhaný. Třeň nápadně dlouhý, někdy až 2krát delší než průměr klobouku. Výtrusy 5—5,5 × 3,5—4,5 µ.
10. Agaricus Beneši PILÁT.

9b Klobouk čistě bílý, nešupinatý, skoro hladký, jen se sporými šupinkatě uvolněnými bílými vlákny. Třeň není nápadně dlouhý, nýbrž spíše dosti tlustý. Výtrusy 9,5—11 × 5,3—6 µ.
9. Agaricus Deylii PILÁT.

9c Klobouk kožově žlutohnědavý s odstínem masovým, hlavně na terči, posléze tmavší, 4—6 cm, hedvábitý, jemně a slabě radiálně vláknitý či vláknitě šupinkatý, s šedými či šedohnědými, někdy dosti nezřetelnými vlákny. Lupeny šedomasové, posléze tmavě černohnědé s bělavým ostřím. Třeň 4—7 × 1,2—1,5 cm, bez hlízovitě ztluštělé base. Dužnina bílá, na řezu masově se zbarvující. Voní slabě, nikoliv mandlově. Výtrusy 7,5—8(10) × 4—5 µ. Cystidy 22—38 × 10—26 µ. Pod listnatými stromy v Dánsku. (Psalliota depauperata Moeller, Friesia 4: 24, t. IIIa, IX, 1950.) *Agaricus depauperatus* (MOELLER).

9d Klobouk bělavý, od počátku pokrytý četnými šupinkami, jež jsou k okraji bledé či hnědavé, a nejhustší jsou na okraji, 6—10 cm v pr. Třeň krátký a poměrně tlustý, 6—8 × 2—3,5 cm, válcovitý či zvolna k dolejšku ztluštělý, bílý, ale často nad

prstenem krásně růžově zbarvený, jako klobouk šupinkatý na spodní polovině, nad prstenem lysý. Dužnina bílá, na řezu živě vínově se zbarvující. Výtrusy 5—7(8) × 3,5—4,5(5) µ. Cystidy 12—26(40) × 4—9 µ. Na lukách pod listnatými stromy nebo volně v trávě, ale také ve starých smrčinách, v Dánsku. Jest blízce příbuzný Agaricus Beneši Pilát a Agaricus Caroli Pilát, ale v podrobnostech rozdílný. (Psalliota squamulifera Moeller, Friesia 4:21, fig. 6, 1950.) *Agaricus squamuliferus* (MOELLER).

9e Klobouk není čistě bílý a většinou již od mládí rozpraskává ve zřetelné šupiny, které nejsou bílé — jen ve vzácných případech je klobouk hladký 10

10a Výtrusy malé, ne větší než 6—7 × 3,5—3,8 µ 11

10b Výtrusy větší 13

11a Klobouk tlustě masitý, veliký, 6—16 cm v pr., rozpraskávající již v mládí v pravidelné a ostře ohraničené, světle šedohnědavé šupiny na bílém podkladu. Třeň tlustý a krátký 6—9 × 1,5 až 2 cm. Výtrusy 6—7,5 × 4—4,5 µ. Ve smrčině na vápencovém podkladu u Karlštejna každoročně.
11. Agaricus Caroli PILÁT.

11b Klobouk menší, sotva 10 cm v pr., mnohem tmaveji zbarvený, méně zřetelně a více přitiskle šupinatý 12

12a Dužnina zbarvuje se na vzduchu jen slabě červeně. Hlíza třeně anýzově voní a žloutne. Třeň pod prstenem s vločkatými kroužky. Výtrusy elipsoidní, 6—7 × 4—5 µ. V lesích listnatých i jehličnatých v Německu, hlavně kolem Berlína. V Čechách nebyl dosud nalezen. Var. *verecundus* MOELLER liší se kloboukem 4—8 cm v pr., oříškově hnědým s tmavými šupinami. Prsten celý bílý, Dánsko. *Agaricus lanipes* MOELL. et SCHAEFF.

12b Čerstvá dužnina zbarvuje se na vzduchu silně vínově až karmínově červeně. Hlíza třeně nežloutne a nevoní anýzově. Třeň pod prstenem hladký. Šupiny na klobouku krátce vláknité, drobnější, umbrové až červenavě hnědé. V lesích jehličnatých i listnatých dosti hojně, hlavně na podkladu vápencovém. Výtrusy 6—6,5 × 3,5—4,3 µ. *12. Agaricus silvaticus* SCHAEFF.

12c Podobá se druhu předcházejícímu, ale má klobouk hladký, silně měďově purpurově červený. Třeň kratší, jen na basi okrově hnědý. Výtrusy 4—5—6 × 3(4) µ. Popsán z Německa. V Československu nebyl dosud zjištěn. Blízký nebo totožný je Agaricus subrutilescens Kauffm. sensu Hotson et Stuntz.
Agaricus silvaticus var. *purpuratus* J. SCHAEFFER.

12d Klobouk 4—6 cm v pr., oříškový, hustě a jemně radiálně vláknitý, ale bez šupin. Třeň válcovitý, bez hlízovité base. Výtrusy 5—7 × 4—4,5 µ. Cystidy 15—32 × 9—16(27) µ. V listnatých lesích v Dánsku. (Psalliota fusco-fibrillosa Moeller, Friesia 4: 27, t IIb, 1950.) *Agaricus fusco-fibrillosus* (MOELLER).

13a Podobá se velice Ag. silvaticus Schaeff., ale jeho plodnice jsou většinou větší a masitější. Klobouk 8—15 cm v pr., tmavě červenohnědý, s většími a výraznějšími šupinami. Výtrusy 8,5—10 × 4,5—5,5 µ. Většinou v jehličnatých lesích na vápencovém podkladu. *13. Agaricus haemorrhoidarius* SCHULZER.

13b Klobouk na temeni světle okrově nahnědlý, ostatně bělavý, rozpraskaný v přitisklé, zřetelné, střechovité a bledě okrově hnědé nebo načervenalé šupinky, sedící na skoro bílém podkladu, 7—9 cm v pr. Třeň štíhlý, 10—16 × 1—1,5 cm, špinavě bílý. Výtrusy 9—11 × 5—5,5(6) µ. Ve smrčině na vápencovém podkladu. *14. Agaricus Annae* PILÁT.

13c Klobouk červenohnědě vláknitě šupinkatý na světlejším podkladu, na temeni hladký, hnědočervený. Výtrusy 6—8,5 × 4—5 µ. V listnatých lesích na vápencovém podkladu. *12. Agaricus silvaticus* var. *pallens* PILÁT.

13d Velice blízce příbuzný Ag. silvaticus var. *pallens* Pilát (či snad totožný?). Třeň bez hlízovitě ztluštělé base, krátký, dole tmavohnědě šupinatý. Klobouk 6—10 cm, posázený oddálenými, čokoládově hnědými šupinami a vlákny, jež kontrastují s bledě lilákově hnědým podkladem. Dužnina mění jen zvolna barvu a to tmavě purpurově. Výtrusy 6—8 × 4—4,5 µ. Cystidy hruškovité, 20—40 × 10—22 µ. V houfech v jehličnatých lesích v Dánsku. (Psalliota mediofusca Moeller, Friesia 4: 30mt. IIam XII, 1950.) *Agaricus mediofuscus* (MOELLER).

13e Třeň s okrouhlou, hlízovitou basí, 8—13 × 1—1,5 cm, zcela bílý. Klobouk 5—10 cm v pr., od počátku čokoládově hnědý, s pokožkou velice brzo a vždy rozpraskávající — kromě temene, které zůstává souvislé — v soustředně uspořádané kruhy šupin, jež jsou přitisklé a menší a bledší k okraji klobouku. Výtrusy 5—6 × 3—3,5 µ. Cystidy balonovité, 15—28 × 12—16 µ. Dužnina bílá, zbarvující se jen slabě lososově. V houfech ve starých smrčinách v Dánsku. Liší se od Ag. silvaticus hlavně barvou a ostřím lupenů, které není bíle vločkaté a od Ag. haemorrhoidarius Kalchbr. tvarem třeně, malými výtrusy a od obou jmenovaných druhů slabým červenáním dužniny. (Psalliota variegata Moeller, Friesia 4: 31, t. Ia, XIII, 1950.) *Agaricus variegatus* MOELLER.

14a Lupeny v mládí (když klobouk počne se rozevírati) nejsou růžové, nýbrž bělavé, pak někdy špinavě masově růžové, posléze čokoládové až černé 15

14b Lupeny v mládí živě růžové nebo masově lososové 23

15a Klobouk s pokožkou hnědookrovou, již brzo v mládí rozpraskávající v hnědočervenavé, přitisklé šupiny, jež jsou pravidelně střechovitě a koncentricky uspořádané na žlutavém podkladu. Třeň hlavně v mládí pod velkým prstenem odstále bíle šupinatý až hrubě vločkatý. Spodní strana prstenu vločkatě šupinkatá. Výtrusy 7,5—10 × 5—5,5 µ. V lesích, hlavně smrkových. *15. Agaricus augustus* FR.

15b Klobouk s pokožkou světlejší, bílou, nažloutlou až žlutou nebo okrově nahnědlou, hladkou či jemně šupinkatou, řidčeji hrubě šupinatě rozpraskanou. Třeň hladký nebo drobně šupinkatý 16

15c Klobouk hnědorezavý, hladký a lysý, vrostle vláknitě šupinkatý 21

16a Výtrusy veliké, delší než 10 µ 17

16b Výtrusy kratší než 10 µ 18

17a Většinou veliká houba s kloboukem až 25 cm v pr., bílým či slabě žlutozelenavým, po poškrabání okrově žloutnoucím, hedvábitě hladce vláknitým. Třeň relativně krátký a tlustý. Dužnina voní anýzově. Výtrusy 10—12(14) × 6—6,5(7) µ. *16. Agaricus macrosporus* (MOELL. et SCHAEFF.).

17b Druh příbuzný předcházejícímu, ale s kloboukem pokrytým hustě okrově hnědými šupinkami či vlákny. Voní příjemně, nikoliv však anýzově. Výtrusy 10—14(16) × 6—7 µ. Dosud nalezen v Německu ve Schleswig-Holstein a v Dánsku (Seeland). Z Československa neznám. *Agaricus stramineus* SCHAEFF. et MOELL. (cf. 16).

17c Klobouk 15—30 cm, nažloutlý, hladký, s hojnými střechovitými, okrovými až hnědými šupinkami, pomačkáním se nebarvící. Třeň 3—5 cm tlustý, delší než průměr klobouku, dole zvolna ztluštělý, pod prstenem obyčejně vatovitě šupinkatý. Prsten mohutný. Lupeny dlouho bílé, pak čokoládově hnědé. Výtrusy elipsoidní, 12—15 µ dl. V jehličnatých lesích na vápencovém podkladu v jihozáp. okolí Prahy. Popis hodí se dosti dobře na Ag. augustus Fr., ale veliké výtrusy ukazují na příbuznost s Ag. stramineus S. et M., s nímž může býti totožný. *Agaricus augustus* sensu VELENOVSKÝ, (České houby, p. 558, 1921).

18a Druhy větší, s kloboukem obyčejně přes 6 cm v pr. . . . 19

18b Druhy menší až zcela malé, s kloboukem obyčejně pod 6 cm v průměru 22

19a Třeň na basi ztluštělý v odsedlou kulovitou či zploštělou hlízu 20

19b Třeň na basi v hlízu neztluštělý, obyčejně jen ploše uťatý, jen v mládí nepatrně vláknitě šupinkatý, brzo olysalý. Klobouk 9—27 cm v pr., bílý, později krémově bílý, až ve stáří bledě žlutavě okrový, skoro hladký a matný. Lupeny dlouho bělavé, pak bledě špinavě masově růžové, později čokoládové. Povrch třeně i klobouku i v mládí po poškrabání žloutne málo. Výtrusy 8—9 × 4,5—5 µ. Hlavně na okraji lesů pod keři nebo v křovinách mezi travou nebo i na jiných místech mimo les. V mládí, když klobouk se rozevírá, podobá se velmi Lepiota naucina. *17. Agaricus cretaceus* FR.

19c Třeň na basi v hlízu neztluštělý, poměrně krátký a tenký, na spodu nanejvýš jen trochu kyjovitě ztluštělý, pod prstenem jemně šupinkatý. Prsten mohutný, vespod nápadně strupatý.

Dužnina po poškrabání nebo na řezu žloutne velice nepatrně a voní jen slabě anýzově. Výtrusy menší a kulatější než u Ag. cretaceus a Ag. arvensis Schaeff. V trávě v listnatém lese.
18. Agaricus osecanus PILÁT.

20a Klobouk v mládí hladký, vláknitý nebo jemně šupinkatý, bílý, častěji však již od mládí se slabým odstínem nažloutlým, později slámožlutý až žlutý. Klobouk i třeň po poškrabání za čerstva žloutnou rychle. Třeň obyčejně v mládí zřetelně šupinkatě vločkatý. Lupeny špinavě bělavé, pak šedorůžové, čokoládové až černé. Výtrusy 6,5—9 × 4—5,3 µ. V lesích, hlavně smrkových, velice hojně. *19. Agaricus arvensis* SCHAEFFER.

20b Klobouk již od mládí rozpukaný ve střechovité, velké, přitisklé, na špičce někdy trochu odstávající šupiny, jen na temeni nešupinatý, světle okrový, v dospělosti okrový do rezava.
Agaricus arvensis var. *macrolepis* PILÁT et POUZAR.

20c Ve všem podobný Agaricus arvensis, ale menší, s kloboukem, i když jest rozevřen, 7—9 cm v pr., zřídka více. Výtrusy mnohem menší, 5,7—6,3 × 3,6—3,8 µ.
20. Agaricus silvicola (VITT.) sensu J. SCHAEFF.

21a Klobouk hladký a lysý, skoro lesklý, hnědorezavý, 4—5 cm v pr. Třeň bělavý, žloutnoucí, 5—6 × 0,5—0,6 cm. Lupeny šedočervenohnědé. Dužnina bělavá, ve třeni žloutnoucí. Výtrusy elipsoidní, 5—6 × 3—4 µ, pod mikroskopem nafialovělé(?). Prach výtrusný tmavohnědý. Cheilocystidy 36—40 × 8—12 µ. V listnatých lesích na vlhkých travnatých místech. (Psalliota sagata Fr. sensu Ricken Blätterp. p. 239, 1915.) Blízký patrně Agaricus flavitingens Murrill sensu Hotson et Stuntz.
Agaricus sagatus FR. sensu RICKEN.

21b Klobouk na celém povrchu pokrytý vrostlými, jemnými vláknitými hnědočerveně či napurpurověle hnědými šupinkami, na okraji bledý, 5,5—7 cm v pr. Lupeny v mládí bílé, pak bledě čokoládové, se slabým odstínem lilákovým. Třeň bílý, dosti krátký, trochu kuželovitý, s naznačenou hlízou, po poškrabání zbarvující se rebarborově žlutě. Dužnina bílá, pak od base třeně nahoru rezavě nažloutlá. Výtrusy 4,7—5 × 3,5 µ, dosti bledě zbarvené. Cystidy obvejčité, 10—18 µ tlusté. V bučině v Dánsku v černém humusu na bažinatém místě. Snad totožná nebo velmi blízká druhu předcházejícímu. Patří do okruhu druhu Agaricus semotus Fr. Patrně totožná jest podle Langeho Psalliota fulvola (Lasch) Fr. Cf. Lange. Fl. Ag. Dan., 4:60, t. 140 C. V Československu nebyla dosud zjištěna. *Agaricus brunneolus* (LANGE).

21c Klobouk hladký, uprostřed vínově červenofialový, k okraji vybledající, až 10 cm v pr. Třeň na basi kyjovitě ztluštělý, žlutorezavý. Lesy v Anglii (Ag. arvensis var. purpurascens Cooke t. 584.) V Československu nebyl dosud nalezen. Zdá se, že jest velmi blízký (nebo totožný) s Agaricus rubellus Gillet.
Agaricus purpurascens (COOKE).

22a Klobouk 3—6 cm v pr. *21. Agaricus rubellus* (GILL.) SACC.

22b Klobouk 1,5—3 cm v pr. *22. Agaricus semotus* FR.

22c Klobouk 0,8—1 cm v průměru.
23. Agaricus minimus (RICKEN).

23a Výtrusy větší než 5,5 × 3,5 µ, ellipsoidní. Druhy větší až veliké, zřídka malé 24

23b Výtrusy menší než 5,5 × 3,5 µ nebo přibližně této velikosti, vejčité až kulovitě vejčité. Drobné až zcela drobné druhy, zřídka trochu větší 27

24a Houba žloutne po poškrabání velice málo, obyčejně vůbec nežloutne nebo žloutnutí projeví se v basi třeně na řezu až po několika hodinách 25

24b Hlavně base třeně žloutne na mladých plodnicích velice rychle. Čerstvé plodnice páchnou slabě, ale nepříjemně, asi jako duběnkový inkoust. Při vaření jest tento zápach dosti intensivní a mnohdy upomíná na karbol. Druhy nejedlé, které působí někdy i slabé otravy. Výtrusy 5,8—7 × 3,5—5,5 µ . . . 26

24c Pokožka klobouku po pomačkání zbarvuje se také žlutě. Dužnina na řezu zbarvuje se však masově nebo rezavě. Srovnej: *Ag. spissus* MOELLER 6d, *Ag. decoratus* MOELLER 30b, *Ag. aestivalis* MOELLER 31a, *Ag. campester* var. *equester* MOELLER 37a, *Ag. campester* var. *floccipes* MOELLER 37b.

25a Houba podobná Agaricus augustus Fr., s kloboukem velkým, plavohnědým, posázeným koncentricky a střechovitě uspořádanými plavými a velmi zřetelnými šupinami, sedícími na bělavém podkladu. Výtrusy 7,5 × 5—5,5 µ. Houbu tuto neznám. Vyobrazuje ji Lange. Zdá se mi, že jest totožná s Agaricus augustus Fr. *24. Agaricus subrufescens* PECK.

25b Houba podobná Agaricus arvensis, s kloboukem čistě bílým, bez žlutavého odstínu, pokrytým bílými, nenápadnými, velice jemnými, ale dosti velikými šupinami, jež při zasychání kloubouku se skoro ztrácejí. Dužnina nevoní anýzově. Výtrusy 8,5—10(10,5) × 4,8—6 µ. *25. Agaricus chionodermus* PILÁT.

26a Klobouk pokrytý přitisklými, střechovitě a dosti pravidelně koncentricky uspořádanými, vláknitými, smutně tmavohnědými nebo okrově šedohnědými šupinkami na bělavém podkladu, na temeni od mládí hnědý až kouřově černavý. V lesích i parcích. Výtrusy 5,8—6(7) × 4,3 µ.
26. Agaricus meleagris J. SCHAEFF.

26b Klobouk skoro vždy v mládí, a pokud jest zastíněný až do úplného stáří, sněhobílý, hladký nerozpukaný. Jen exempláře ozářené přímými paprsky slunečními mají klobouk smutně šedavý nebo šedohnědý a pokožka jejich rozpraskává políčkovitě, to jest radiálně i příčně, takže vznikají nepravidelné, většinou veliké a dosti hluboké šupiny, které jsou často jen na

jedné straně klobouku vytvořeny, když byl klobouk ozářen sluncem se strany. V lesích i v parcích. Hojný v některých krajinách, hlavně na půdách vápencových. Výtrusy 6—6,8(7,2) × 4—5,5 μ. *27. Agaricus xanthodermus* GENEV.

27a Klobouk bílý, pak většinou nažloutle bílý a masově nadechlý, 2,5—3,5 cm v pr. Houba vypadá jako miniaturní Agaricus campester. Výtrusy 4,5—5,5 × 3—3,5 μ. Většinou v trávě mimo les. *28. Agaricus rusiophyllus* LASCH.

27b Klobouk cihlově červený, pokrytý jemnými šupinkami, 3 až 4,5 cm v pr. Třeň 3 mm tlustý, na dolejšku skoro neztluštělý, pod prstenem spoře měkce šupinkatý. Lupeny růžové, pak makové až čokoládové. Výtrusy kulovité, 5 μ. Cheilocystidy veliké, kulaté. Na stepních pahorcích v okolí pražském. Plodnice tohoto druhu jsem nikdy neviděl. Jest patrně příbuzný Ag. semotus Fr. *Agaricus lateritius* VELENOVSKÝ, 1939.

28a Třeň dosti štíhlý, často dutý, válcovitý nebo na dolejšku tlustší. Klobouk bělavý. V lesích v jehličí nebo v listí 29

28b Třeň krátký, vycpaný, často dolů ztenčený. Klobouk bílý, hnědý či s odstínem lilákovým. Na lukách a v polích mezi trávou 32

29a Klobouk vejčitě či zvoncovitě sklenutý, pomačkáním nezbarvující se žlutě. Dužnina páchne podobně jako bedla hřebenitá (Lepiota cristata). Druhy rostoucí pozdě na podzim . . . 30

29b Klobouk více ploše sklenutý, nabíhající více méně do žluta. Vůně slabě nakyslá. Časně se objevující druhy 31

30a Prsten jednoduchý. Klobouk skoro hladký. V jehličnatých lesích v Dánsku. Klobouk 4—7 cm v pr., zvoncovitý, pak ploše sklenutý, s nápadným, širokým hrbolem, bílý, s odstínem kožově žlutohnědavým, skoro lysý či slabě vločkatě šupinkatý. Lupeny nerozevřených plodnic živě růžově masové. Třeň 8—10 × 1,2—2 cm, z trochu kyjovité base nahoru se ztenčující, bílý, dolů s masovým odstínem. Prsten velice krátký, bílý. Dužnina bílá, na lomu masovějící, k basi okrová či nahnědlá. Voní nepříjemně. Basidie 4výtrusé. Výtrusy 6—8 × 4,5—5 μ. (Psalliota altipes Moeller, Friesia 4: 46, fig. 9, 1950). *Agaricus altipes* (MOELLER).

30b Prsten s dvojitým ostřím. Klobouk šupinkatý. V listnatých lesích v Dánsku. Klobouk 4—7 cm v pr., vejčitě zvoncovitý, pak sklenutě rozložený, bílý, často uprostřed bledě nahnědlý, hustě vločkatě šupinatý, se šupinami přitisklými, roztroušenými, stejně zbarvenými, přišpičatělými. Lupeny v mládí krásně růžové, s plodným ostřím. Třeň 5—10 × 1,5—2,5 cm, nahoru ztenčený, bílý, často nad prstenem s odstínem růžovým, nahý, po pomačkání zbarvující se pod prstenem žlutě. Dužnina bílá, slabě masově se zbarvující. Vůně nepříjemná. Výtrusy 7—8 × 4,5—5 μ. Basidie 4výtrusé. (Psalliota decorata Moeller, Friesia 4: 48, fig. 10, 1950.) *Agaricus decoratus* (MOELLER).

31a Pokožka zbarvuje se po pomačkání slabě žlutě. Klobouk 5 až 10 cm, lesklý, bílý, po pomačkání se sírožlutým odstínem, s jemnými, přitisklými, hedvábitými vlákny, později někdy sem tam s malými, přitisklými šupinami. Lupeny zprvu živě masově růžové. Třeň 4—9 × 1,5—3 cm, válcovitý nebo nahoru ztenčený, bílý, po omačkání žloutnoucí, často nahoře růžový. Prsten tenký, mizivý, jednoduchý. Dužnina dosti tenká, bílá, v hořejší části třeně světle růžová. Voní slabě. Výtrusy 6—8 × 4 až 4,5(5) μ. Basidie 4výtrusé. V houfech v jehličnatých lesích v Dánsku, často pod jedlemi. (Psalliota aestivalis Moeller, Friesia 4: 50, 1950.) *Agaricus aestivalis* (MOELLER).

31b Pokožka zbarvuje se živě žlutě. Výtrusy 6,5—8 × 4—5 μ. V houfech v jehličnatých lesích v Dánsku, někdy také pod buky. *Agaricus aestivalis* (MOELLER) var. *flavotactus* (MOELLER).

32a Klobouk tmavě zbarvený (hnědě či šedě), často s odstínem lilákovým 33

32b Klobouk zbarvený světleji 35

33a Výtrusy 6 × 4—5 μ, vejčitě-kulovité. Klobouk fialově šedý, 5—6 cm, nejsvětlejší na temeni a zde s nesčetnými, malými, tmavošedými, přitisklými šupinami, radiálně žíhaný vrostlými vlákny. Lupeny zprvu živě masově lososové. Třeň 4—5 × 1,2 až 1,5 cm, trochu ztenčený k basi, zprvu bělavý, pak zbarvující se šedě a posléze na dolejšku hnědě. Prsten úzký, mizivý, jednoduchý. Dužnina bělavá, se slabým červenavým odstínem, hlavně nahoře ve třeni; v dolejšku špinavě žlutá. Voní slabě, trochu nakysle. V houfech v křovinách v Dánsku. (Psalliota lividonitida Moeller, Friesia 4: 51, 1950.) *Agaricus livido-nitidus* (MOELLER).

33b Klobouk hnědavě červený či tmavohnědý s lilákovým odstínem 34

34a Klobouk porfyrově (nafialověle) hnědý, hladký, vláknitý a více méně tmavě šupinkatý, 4—6 cm, polokulovitý, pak ploše sklenutý, s tmavším středem. Lupeny zprvu živě lososově růžové. Třeň dolu ztluštělý, 3—5 × 1,5—2 cm, hlízovitý nebo trochu vřetenitý, bílý, na basi porfyrově zbarvený, pod prstenem vločkatě vláknitý. Prsten bílý, úzký, jednoduchý. Dužnina bílá, na lomu slabě masově se zbarvující. Vůně slabá, nakyslá. Výtrusy vejčité, 5—7 × 3,25—4,5 μ. Basidie 4výtrusé. V houfech na lukách v Dánsku. (Psalliota porphyrea Moeller, Friesia 4: 53, 1950, t. IVc.) *Agaricus porphyreus* (MOELLER).

34b Klobouk lilákový či napurpurověle hnědý, vločkatě šupinkatý, 5—7 cm, polokulovitý, pak sklenutý, s vmačklým středem. Lupeny živě lososově růžové. Třeň 3—4 × 1—1,5 cm, často dolů ztenčený, bílý, s masově zbarvenou hořejší částí, pod prstenem zprvu vločkovitě šupinkatý, pak hladký. Prsten tenký, úzký a jednoduchý. Dužnina bílá, na lomu slabě červenající. Vůně slabá, nakyslá. Basidie 4výtrusé. Výtrusy vejčité, 7—9 × 4 až

5(6) µ. V houfech na lukách v Dánsku a Německu. (Psalliota campestris var. cupreo-brunnea Schaeff. et Steer, Michael, Führer für Pilzfr. I, p. 147, 1939. — Deutsche Blätter f. Pilzk. 3:5, 1941. — P. cupreo-brunnea [S. et S.] Moeller, Friesia, 4:54, t. IVb, XVI, 1950.)

Agaricus cupreo-brunneus (SCHAEFF. et STEER) n. c.

35a Klobouk bílý, někdy nabíhající trochu do žluta 36

35b Klobouk hlínově žlutý nebo bílý, s hnědými šupinami a vlákny 38

36a Klobouk 5—8 cm, bílý, hustě vločkatě šupinkatý. Lupeny široké. Výtrusy 7—8 × 4—5 µ.

4. Agaricus campester FR. et L.

36b Klobouk 3—5 cm, skoro hladký, bílý, po omakání nabíhající do žluta. Lupeny dosti úzké. Výtrusy 6—7 × 4—5 µ 37

37a Třeň asi 1 cm tlustý, nad prstenem hladký. Dužnina tenká.

Agaricus campester var. *equester* (MOELLER 1950).

37b Třeň 1—2 cm tlustý, nad prstenem vločkatě šupinkatý jako u slzivek (Hebeloma). Dužnina tenká a pevná.

Agaricus campester var. *floccipes* (MOELLER 1950).

38a Klobouk 4—8 cm, bílý s tmavohnědými vlákny. Třeň dosti silný a štíhlý. Výtrusy 7—8,5 × 6—6 µ.

Agaricus campester var. *fusco-pilosellus* (MOELLER 1950).

38b Klobouk 3—4 cm, se sporými, malými, plochými, hnědými šupinkami. Třeň krátký. 7—8 × 4—5 µ 39

39a Klobouk s bílým podkladem. Třeň 1—1,75 cm tlustý.

Agaricus campester var. *squamulosus* REA.

39b Klobouk s hlínově žlutým podkladem. Třeň 1 cm tlustý.

Agaricus campester var. *isabellinus* (MOELLER 1950).

*

The present paper is the result of the studies which I devoted chiefly in 1950 to the genus *Agaricus*. Of course I have been interested in the Bohemian species of the genus Agaricus for the whole preceding twenty years, and collected a large documentary material in the herbarium of the National Museum in Prague, by collecting myself as well as by exchange with foreign mycologists. It is this material which I have used. For all that this work is no monograph of the Bohemian species, but only a contribution to their study. I have taken the opportunity to recapitulate as far as possible all the knowledge obtained up till now on the Bohemian species, and I have tried to arrange the species in the clearest possible way.

The year 1950 was exceptionally favourable for the growth of mushrooms, or at least it seemed so to me, perhaps because I may have taken more notice of them than in other years.

The genus *Agaricus*, though comprising predominantly large, fleshy and economically important species, is nevertheless one of the least known genera among our fungi. It comprises a considerable number of species, a much larger number than has been known and described up till now. Many species are difficult to distinguish because of their close affinity and because the characters by which they are distinguished are not very striking. We must first learn to look at mushrooms; then only is it possible to study them. Even species artificially cultivated are little known. The cultivated species are designated in the literature mostly as Agaricus campester, or as cultural races formed by cultivation from this species. But this designation is false. *Agaricus campester* is not cultivated at all, to judge from the material which I have had, and in my opinion it would cultivate badly as it is not a fungus pronouncedly coprophile like the two bisporic species which are the ones chiefly cultivated, viz. *Agaricus hortensis* COOKE and *Agaricus bisporus* LANGE. These two mushrooms are not varieties, but good species not formed through cultivation, for they grow wild and from nature were taken over into cultivation. That their receptacles grown in the dark, under different conditions of temperature and humidity, look sometimes slightly different is understandable. *Ag. villaticus* BROND. is also, though rarely, cultivated in Europe and in America.

Cayley (Experimental spawn and mushroom culture II. Arteficial composts. Ann. Appl. Biol. 25: 322—340, 1938) studied the growth of mycelia from various mushrooms on composted and non-composted manure. From this it is evident, that the wild 4-spored *Agaricus campester* and two other wild *Agaricus* forms are unable to grow on horse manure fermented by heating, which is the ordinary medium for the cultivated 2-spore forms. Cf. also *C. Treschow:* Taxonomy of the cultivated mushroom, Friesia 3: 26, 1945.

The study of the European species of the genus *Agaricus* is only at its beginning. What is known, is known only very imperfectly and fragmentarily. Thus also the names by which the different species are designated have to be regarded as provisional. It is difficult to take one's stand on priority, as the different species are cumulative in the old and also in the more recent authors, so that is is often difficult to say which species an author had in mind when describing his material. I do not regard names as the main question; I am much more interested in the question how many mushrooms grow in our country, how they look, and in what way they differ from each other.

In recent times J. E. LANGE, JULIUS SCHAEFFER and F. MOELLER have contributed most to the knowledge of the European mushrooms. Of course their work does not by far exhaust the wealth of European species. The value of their contributions lies chiefly in the critical descriptions and good figurings.

In Sweden R. RYDBERG is engaged in the study of the genus *Agaricus*, but he has not yet published the results of his work of many years.

For the knowledge of the American, and of course also the European species especially two articles are very important: ALEXANDER H. SMITH: Studies in the genus Agaricus, Pap. Michigan Ac. Sc. 25: 107—137,

1940, and J. W. HOTSON & D. E. STUNTZ: The genus Agaricus in Western Washington, Mycologia 30: 204—234, 1938. The other publications are listed in the bibliography.

Survey of the Bohemian and Centraleuropean Species.

1a Flesh when fresh (especially in younger receptacles) slightly red when cut, then colouring rusty or almost not changing at all *(Rufescentes)* 2

1b Flesh of fresh young receptacles colouring when cut intensively wine or carmine red *(Sanguinolentae)* 9

1c Flesh when cut colouring yellow, at least after a longer time and especially in the lower part of the stem *(Flaventes)* . . 14

1d Flesh pale, at the surface of the stem purple red, but on the whole not changing colour in the air. Gills dark purple red, then brown to almost black. Spores 4—5 × 2—3 µ, a long time pale, then yellowish brown, much lighter than in the other species of the genus Agaricus. Sporee smoky, sometimes with a slight purple tinge *(Melanophyllum* VEL.). Pileus 1,5—3 cm., loam brown to blackish. Smell of cucumber.
1. Agaricus haematospermus FR. ex BULL.

2a Pileus white, at least in youth 3

2b Pileus not white either in youth or later, but coloured, mostly brown 7

3a Velum universale not markedly developed and not attaching itself to the base as a continuous ochrea 4

3b Velum universale strongly and markedly developed; in youth it envelops uninterruptedly the whole receptacle, so that this looks as in Lycoperdon; later it leaves an ochrea grown to the base of the stem and at the upper margin slightly turned up like a border. Spores 4—6 × 4—5 µ.
2. Agaricus edulis (VITT.) MOELL. et SCHAEFF.

4a Pileus large, 12—20 cm. in diameter. Flesh with pleasant smell 5

4b Pileus smaller, 5—15 cm. in diameter. Flesh with pleasant smell 6

5a Pileus in maturity cracked, especially in dry weather. Spores according to Quélet subglobose, 8 µ; according to Rea 9—11 × 5,5—6,5 µ; according to Moeller (1950): "ovately round with a large gutta 5,5—7(10) × 5—6 µ".
3. Agaricus Bernardi (QUÉL.) SACC. — non RICKEN.

5b Pileus smooth. Spores 8—11 × 5,5—6,5 µ. Resembling Agaricus macrosporus J. Schaeff., but the flesh does not turn yellow and it smells of horse urine. It seems to be conspecific with Ag. Bernardi Quél. *Agaricus urinascens* J. SCHAEFF. et MOELL.

5c Pileus radially floccoco-squamose, 6—10 cm. Scales thin. Not in fairy rings. On the bare ground under deciduous or coniferous trees (Taxus, Picea etc.). Flesh white, bright rose colour when cut. Smell fishy, stinking. Spores roundish with large gutta 5,5—7(8) × 4,5—5,5(6) µ. Cystidia 30—64 × 6—20 µ. — This species is allied or identical with *Agaricus algodorus* Ing. et Rdb. in Ingelström, Svampflora p. 105, 1940, which had a smell of seaweed and the flesh finally becomes greyish pink in the whole fungus. (Psalliota ingrata, Moeller, Friesia, 4: 17, fig. 5, t. VIII.) . *Agaricus ingratus* (MOELLER).

6a Basidia tetrasporic. The young pileus — as long as in bud — is more or less globose, smooth in youth, later almost always in rather dry weater radially to squamosely, deeply cracked. Spores 7—10 × 5—6 µ. In meadows and in ditches along the roads among the grass, more rarely in other places. It is not cultivated. *4. Agaricus campester* FR. ex L.

6b Basidia bisporic. The young pileus, as long as in bud, but also later at the apex broadly plane, in youth smooth and white, soon however in the centre dirty grayish brown, towards the margin cracked into very fine, fibrillose squamules. Spores broader, 7—8,3 × 5—5,5 µ. Coprophile species, growing on the bare soil strongly manured, especially with urine. Cultivated on straw manure. In nature dispersed, especially in gardens, on bare spots soaked with urine and dung of animals.
5. Agaricus hortensis (COOKE) PILÁT.

6c Basidia tetrasporic. Pileus only 2,5—3,5 cm., white, then slightly yellowish. Small fungus, growing among the grass and looking like a miniature Agaricus campester. Spores short ovoid, 4,5—5 × 3—3,5 µ. Cf. 28a. *28. Agaricus rusiophyllus* LASCH.

6d Basidia tetrasporic. Pileus whitish with greyish-reddish tinge, often turning yellow when touched, 5—8 cm., with brownish adpressed broad, but ofter obliterated scales, in dry weather with cracked pellicle. Margin of cap without the striation. Gills light flesh colour, finally brownish black. Stem sufusiform, thick and short, 3—5 × 2—3 cm., concolorous with the cap, smooth. Ring membranaceous, sheathed above. Flesh thick, white, greyish red when broken. Spores roundish, 5—7 × 4—5,5 µ. Cystidia narrowly clavate to cylindrical, 18—32(60) × 3—7 (9) µ. Smell weak, pleasant, somewhat like almonds. Gregarious in meadows in Denmark. (Psalliota spissa Moeller, Friesia 4: 43, t. IIIb, 1950.) . . . . . *Agaricus spissus* (MOELLER.)

6e Basidia tetrasporic. Species of the "Campestris" group after Moeller (Danish Psalliota Species, Friesia 4: 44, 1950): Cystidia on edge not distinctly developed, the gill-edge being set with numerous cells of the form and size of basidia, as well as with fertile basidia. Gills bright rosy flesh colour ("campestris" red). Pileus white to brown, fibrillose or squamulose. Ring very shortly sheathed above, thin and fragile 28

7a Basidia bisporic. Pileus 4—8(10) cm. in diameter, dirty brownish to saturated dark brown, in youth plane at the apex, towards the margin mostly shiny and radially fibrillose to broadly squamosely cracked. On the bare soil, on manured places, in fields, compost, more rarely in forests. Artificially cultivated. Spores broadly ovoid, 6,5—7,5(10) × 5—6(7) µ.
6. Agaricus bisporus (LANGE).

7b Basidia tetrasporic 8

8a Pileus 6—8 cm. in diameter, with tomentose-fibrillose cuticle, brown, lighter towards the margin. Spores broadly ovoid, 6,5 × 4 µ. Seems to be a tetrasporic race of Ag. bisporus Lange. Rare, in forests and outside the forests.
7. Agaricus subfloccosus LANGE.

8b Pileus larger, up to 20 cm. in diameter, with thick and hard flesh, covered with dark brown, fibrillose and large, adpressed squamules. Stem thick, provided with a strikingly thick and tough ring. Below the ring annular or zonal remnants of the velum universale. Spores 6,5—8 × 5—6 µ, subglobose. On rubbish-heaps, especially in towns, but also on the border of roads and in gardens.
8. Agaricus villaticus BROND.

9a Pileus pure white, rather soon torn into medium sized and adpressed squamules. Stem strikingly long, sometimes up to twice as long as the diameter of the pileus. Spores 5—5,5 × 3,5—4,5 µ.
10. Agaricus Beneši PILÁT.

9b Pileus pure white, non-squamose, almost smooth, only with sparse, squamosely detached, white fibrils. Stem not strikingly long, but rather fairly thick. Spores 9,5—11 × 5,3—6 µ.
9. Agaricus Deylii PILÁT.

9c Pileus alutaceous with a faint flesh-coloured tinge, especially on the disc, at length darker, 4—6 cm., silky, minutely and slightly radially fibrillose or fibrilloso-squamulose with grey or greyish brown sometimes rather indistinct fibrils. Gills greyish flesh coloured, finally dark blackish brown with white edge. Stem 4—7 × 1,2—1,5 cm., without bulbous base. Flesh white, becoming flesh colour when cut. Smell very weak, not like almonds. Spores 7,5—8,5(10) × 4—5 µ. Cystidia 22—38 × 10—26 µ. Under deciduous trees in Denmark. (Psalliota depauperata Moeller, Friesia 4: 24, t. III a, IX, 1950
Agaricus depauperatus MOELLER.

9d Pileus whitish, covered at first with numerous squamules pale or brownish towards the edge, densest toward the edge, 6—10 cm. Stem short and comparatively thick, 6—8 × 2—3,5 cm., cylindrical or gradually thicker towards base, white, but often with a beautiful rose colour above the ring, squamulose like the cap in the lower half, smooth above the ring. Flesh white, bright vine colour when cut. Smell acidulous, sometimes fruit-like. Spores 5—7(8) × 3,5—4,5(5) µ. Cystidia

12—26(40) × 4—9 µ. In meadows with or without deciduous trees and in old Picea woods in Denmark. Allied to Ag. Beneši Pilát and Ag. Caroli Pilát, but different. (Psalliota squamulifera Moeller, Friesia 4: 21, fig. 6, 1950.)
Agaricus squamuliferus MOELLER.

9e Pileus not pure white and mostly already in youth cracked into distinct squamules which are not white — the pileus is smooth only in rare cases 10

10a Spores small, not larger than 6—7 × 3,5—3,8 µ 11

10b Spores larger 13

11a Pileus thick fleshy, large, 6—16 cm. in diameter, cracking already in youth into regular and sharply delimited, light greyish brown squamules on a white background. Stem thick and short, 6—9 × 1,5—2 cm. Spores 6—7,5 × 4—4,5 µ. In the spruce forest on a limestone substratum at Karlštejn every year.
11. Agaricus Caroli PILÁT.

11b Pileus smaller, hardly 10 cm. in diameter, much darker coloured, less distinct and more adpressed squamules 12

12a The flesh colours in the air only slightly red. Bulb of the stem smelling of anise and turning yellow. Stem below the ring with floccose circles. Spores ellipsoid, 6—7 × 4—5 µ. In deciduous and coniferous forests; in Germany, especially around Berlin. Not yet found in Bohemia Var. *verecundus* MOELLER is different with the pileus 4—8 cm., hazel with dark scales. Ring wholly white (Denmark). *Agaricus lanipes* MOELL. et SCHAEFF.

12b When fresh the flesh colours in the air strongly wine to carmine red. The bulb of the stem does not turn yellow and does not smell of anise. Stem below the ring smooth. Squamules on the pileus short-fibrillose, smaller, umber to reddish brown. In coniferous and deciduous forests rather abundant, especially on a limestone substratum. Spores 6—6,5 × 3,5—4,3 µ.
12. Agaricus silvaticus SCHAEFF.

12c Resembles the preceding species, but its pileus is smooth, strongly coppery purple red. Stem shorter, ochraceous brown only at the base. Spores 4—5—6 × 3(4) µ. Described from Germany. Not yet diagnosed in Czechoslovakia. Closely related or conspecific is Agaricus subrutilescens Kauffm. sensu Hotson et Stuntz. *Agaricus silvaticus* var. *purpuratus* J. SCHAEFF.

12d Pileus 4—6 cm., dark hazel, densely and finely radially fibrillose, but without scales. Stem cylindrical without bulbous base. Spores 5—7 × 4—4,5 µ. Cystidia 15—32 × 9—16(27) µ. Deciduous woods in Denmark. (Psalliota fusco-fibrillosa Moeller, Friesia 4: 27, t. IIb. 1950.)
Agaricus fusco-fibrillosus MOELLER.

13a Resembles greatly Ag. silvaticus Schaeff., but its receptacles are mostly larger and fleshier. Pileus 8—15 cm. in diameter, dark reddish brown, with large and more characteristic squamules. Spores 8,5—10 × 4,5—5,5 µ. Mostly in coniferous forests on a limestone substratum.
13. Agaricus haemorrhoidarius SCHULZER.

13b Pileus at the apex light ochraceus brownish, the rest whitish, cracked into adpressed, distinct, imbricate, and pale ochraceous brown or reddish squamules, sitting on an almost white background, 7—9 cm. in diameter. Stem slender, 10—16 × 1—1,5 cm., dirty white. Spores 9—11 × 5—5,5(6) µ. In spruce forests on a limestone substratum. *14. Agaricus Annae* PILÁT.

13c Pileus reddish brown, fibrillose-squamose on a lighter background, at the apex smooth, brownish red. Spores 6—8,5 × 4—5 µ. In deciduous forests on a limestone substratum.
12. Agaricus silvaticus var. *pallens* PILÁT.

13d Nearly allied to Ag. silvaticus var. *pallens* Pilát (or perhaps identical?). Stem without bulbous base, short, dark brown scaly below. Pileus 6—10 cm., with distant chocolate-brown scales and fibrils and form a clear contrast to the pale lilac brown ground. The flesh only changes colour slightly and to a deep purple. Spores 6—8 × 4—4,5 µ. Cystidia pearshaped, 20—40 × 10—22 µ. Gregarious in coniferous woods in Denmark. (Psalliota mediofusca Moeller, Friesia 4:30, t. IIa, XII, 1950.)
Agaricus mediofuscus MOELLER.

13e Stem with round bulbous base, 8—13 × 1—1,5 cm, quite white. Pileus 5—10 cm, chocolate-brown at first, the pellicle very soon, however, breaking up into a broad blackish brown scull-cap surrounded by concentric, sparse, brown, transversal, adpressed squamules on a pale ground fading in coulour and reduced in size towards the margin. Spores 5—6 × 3—3,5 µ. Cystidia baloon-shaped, 15—28 × 12—16 µ. Gregarious in old woods of Picea in Denmark. Flesh white, only very faintly turning pink. It differs from Ag. silvaticus especially in the colour and edge of the gills which is not coarsely white-floccose, and from Ag. haemorrhoidarius Kalchbr. in the form of the stem and the small spores and from both in the faint rubescence of the flesh. (Psalliota variegata Moeller, Friesia 4:31, t. Ia, XIII, 1950) . . . . . *Agaricus variegatus* MOELLER.

14a Gills in youth (when the pileus begins to open out) not rose, but whitish, then sometimes dirty flesh rose, finally chocolate to black 15

14b Gills in youth vividly rose or flesh salmon 23

15a Pileus with brownish ochraceous cuticle which cracks early in youth into brownish reddish, adpressed squamules which are arranged in a regular, imbricate and concentric way on a yellowish background. Stem especially in youth below the

large ring with distant, white squamules or even coarsely floccose. Underside of the ring floccose-squamose. Spores 7,5—10 × 5—5,5 µ. In forests, especially of spruce.
15. Agaricus augustus FR.

15b Pileus with lighter, white, yellowish to yellow or ochraceous brownish, smooth or finely squamose cuticle, rarely cracked into coarse squamules. Stem smooth or finely squamose 16

15c Pileus brownish ochraceous, smooth to glabrose or innately fibrillose-squamose 21

16a Spores large, longer than 10 µ 17

16b Spores shorter than 10 µ 18

17a Mostly a large fungus with a pileus up to 25 cm. in diameter, white or slightly yellowish greenish, turning ochraceous yellow when scratched, silkily smoothly fibrillose. Stem relatively short and thick. Flesh smelling of anise. Spores 10—12(14) × 6—6,5(7) µ. *16. Agaricus macrosporus* (MOELL. et SCHAEFF.).

17b Species related to the preceding one, but with the pileus covered crowdedly with ochraceous brown squamules or fibrils. Smell pleasant, but not of anise. Spores 10—14(16) × 6—7 µ. Found up till now in Germany in Schleswig-Holstein and in Denmark (Sjaelland). Not known from Czechoslovakia.
Agaricus stramineus SCHAEFF. et MOELL. (cf. 16).

17c Pileus 15—30 cm., yellowish, smooth, with abundant, imbricate, ochraceous to brown squamules, not colouring where bruised. Stem 3—5 cm. thick, longer than the diameter of the pileus, gradually thickening downwards, below the ring usually cottony-squamose. Ring big. Gills a long time white, then chocolate brown. Spores ellipsoid, 12—15 µ long. In coniferous forests on a limestone substratum in the southwestern environments of Prague The description fits rather well Ag. augustus Fr., but the large spores indicate an affinity with Ag. stramineus S. et M., with which it may be conspecific.
Agaricus augustus sensu VELENOVSKÝ (České houby, p. 558, 1921).

18a Larger species, with the pileus usually over 6 cm. in diameter 19

18b Smaller species to quite small ones, with the pileus usually under 6 cm. in diameter 22

19a Stem at the base thickened into a sharply marked-off globose or flattened bulb 20

19b Stem at the base not thickened into a bulb, usually only flatly truncated, only in youth slightly fibrillous-squamose, soon glabrose. Pileus 9—27 cm. in diameter, white, later creamy white, in old age pale yellowish ochre, nearly smooth and mate. Gills long whitish, then pale dirty flesh rose, then chocolate. Surface of stem and pileus also in youth becoming but little

yellow when scratched. Spores 8—9 × 4,5—5 µ. Especially on the margin of forests under bushes or in thickets among the grass, or in other places outside the forest. In youth when the pileus unfolds it resembles much Lepiota naucina.
17. Agaricus cretaceus FR.

19c Stem at the base not thickened, finely squamose below the ring. Ring big, strikingly crusty below. Flesh when scratched or cut becoming very slightly yellow and with only a slight smell of anise. Spores smaller and more globose than in Ag. cretaceous and Ag. arvensis Schaeff. In the grass in deciduous forests. *18. Agaricus osecanus* PILÁT.

20a Pileus in youth smooth, fibrillose or firmly squamose, white, but more often already in youth with a slight yellowish tinge, later straw-yellow to yellow. Pileus and stem when scratched becoming quickly yellow when fresh. Stem in youth usually distinctly squamose-floccose. Gills dirty whitish, then grayish rose, chocolate to black. Spores 6,5—9 × 4—5,3 µ. In forests, especially in spruce forests, very abundant.
19. Agaricus arvensis SCHAEFFER.

20b Pileus cracked already in youth into imbricate, large, adpressed squamules which are sometimes slightly distant at the tip, only at the apex not squamose, light ochraceous, in maturity ochraceous to rusty.
Agaricus arvensis var. *macrolepis* PILÁT et POUZAR.

20c In every respect like Agaricus arvensis, but smaller, with the pileus even when expanded 7—9 cm. in diameter, rarely more. Spores much smaller, 5,7—6,3 × 3,6—3,8 µ.
20. Agaricus silvicola (VITT.) sensu J. SCHAEFF.

21a Pileus smooth to glabrose, almost shiny, brownish rusty, 4—5 cm. in diameter. Stem whitish, becoming yellow, 5—6 × 0,5—0,6 cm. Gills grayish reddish brown. Flesh whitish, becoming yellowish in the stem. Spores ellipsoid, 5—6 × 8—12 µ. In deciduous forests in moist grassy places. (Psalliota sagata Fr. sensu Ricken, Blätterp. p. 239, 1915.) Apparently close to it is Agaricus flavitinges Murrill sensu Hotson et Stuntz.
Agaricus sagatus FR. sensu RICKEN.

21b Pileus covered on the whole surface with innate, fine fibrillose, brownish red or purplish brown squamules, pale at the margin, 5,5—7 cm. in diameter. Gills white in youth, then pale chocolate, with a light lilac tint. Stem white, rather short, slightly conical, with a indistinct bulb, turning rhubarb yellow when scratched. Flesh white, then from the base of the stem upwards rusty yellow. Spores 4,7—5 × 3,5 µ, rather pale coloured. Cystidia obovate, 10—18 µ thick. In beech forest in Denmark in black humus in an marshy place. Perhaps conspecific with or very close to the preceding species. It belongs to the circle of the species Agaricus semotus Fr. Psalliota

fulvola (Lasch.) Fr. seems to be conspecific according to Lange. Cf. Lange Fl. Ag. Dan., 4: 60, t. 140C. Not yet found in Czechoslovakia. *Agaricus brunneolus* (LANGE).

21c Pileus smooth, in the middle wine reddish violet, paling towards the margin, up to 10 cm. in diameter. Stem at the base clavately thickened, yellowish rusty. Woods in England (Ag. arvensis var. purpurasceus Cooke t. 584). Not yet found in Czechoslovakia. It seems to be very close to (or conspecific with) Agaricus rubellus Gillet. *Agaricus purpurascens* (COOKE).

22a Pileus 3—6 cm. in diameter.
21. Agaricus rubellus (GILL.) SACC.

22b Pileus 1,5—3 cm. in diameter. *22. Agaricus semotus* FR.

22c Pileus 0,8—1 cm. in diameter. *23. Agaricus minimus* (RICKEN).

23a Spores larger than 5,5 × 3,5 µ, ellipsoid. Fairly large to large, rarely small species 24

23b Spores smaller than 5,5 × 3,5 µ or of approximately that size, ovoid to globose ovoid. Tiny to minute species, rarely slightly larger 27

24a The fungus turns very slightly yellow when scratched, usually it does not turn yellow at all, or it does so only at the base of the stem when cut after several hours 25

24b Especially the base of the stem turns very quickly yellow in young specimens. Fresh receptacles have a slight but unpleasant smell rather like gallnut-ink. In boiling this smell is rather intensive and often reminiscent of carbolic acid. Non-edible species, sometimes producing even slight poisonings. Spores 5,8—7 × 3,5—5,5 µ 26

24c Pellicle of the pileus when touched becoming also yellow. The flesh when cut becoming flesh colour: cf. *Ag. spissus* MOELLER 6d, *Ag. decoratus* MOELLER 30b, *Ag. aestivalis* MOELLER 31a, *Ag. campester* var. *equester* MOELLER 37a, var. *floccipes* MOELLER 37b.

25a Fungus similar to Agaricus augustus Fr., with a large, tawny brown pileus studded with concentrically arranged or imbricate, tawny and very distinct squamules sitting on a whitish background. Spores 7,5 × 5—5,5 µ. I do not know this fungus. Figured by Lange. It seems to be conspecific with Agaricus augustus Fr. *24. Agaricus subrufescens* PECK.

25b Fungus similar to Agaricus arvensis, with the pileus pure white, without a yellowish tinge, covered with white, nonstriking, very fine, but fairly large squamules which almost disappear when the pileus dries. Flesh not smelling of anise. Spores 8,5—10(10,5) × 4,8—6 µ.
25. Agaricus chionodermus PILÁT.

26a Pileus covered with adpressed, imbricate and fairly regularly arranged, fibrillose, turbidly dark brown or ochraceous grayish brown squamules on a white background, in youth brown to smoky blackish at the apex. In forests and parks. Spores 5,8—6(7) × 3,5—4,3 µ. *26. Agaricus meleagris* J. SCHAEFF.

26a Pileus almost always snow white in youth and when shaded even to maturity, smooth, not cracked. Only specimens exposed to the direct rays of the sun have a turbidly gray or grayish brown pileus and their cuticle cracks areolately, i. e. radially and transversally so that irregular, mostly large and fairly deep squamules are formed, often developed only on one side of the pileus when this was exposed to the sun only on one side. In forests and parks. Abundant in some regions, especially on calcareous soils. Spores 6—6,8(7,2) × 4—5,5 µ.
27. Agaricus xanthodermus GENEV.

27a Pileus white, then mostly yellowish white with a flesh coloured tinge, 2,5—3,5 cm. in diameter. The pileus looks like a miniature Agaricus campester. Spores 4,5—5,5 × 3—3,5 µ. Mostly in the grass outside the forest. *28. Agaricus rusiophyllus* LASCH.

27b Pileus brick red, covered with fine squamules, 3—4,5 cm. in diameter. Stem 3 mm. thick, almost unthickened below, below the ring sparsely softly squamose. Gills rose, then scarlet poppy to chocolate. Spores globose, 5 µ. Cheilocystidia large, globose. On steppe hills around Prague. I have never seen the receptacle of this species. It seems to be related to Ag. semotus Fr.
Agaricus lateritius VELENOVSKÝ, 1939.

28a Stem rather tall, often hollow, cylindrical or thicker at base. Pileus whitish. In woods on dead needles or leaves . . . 29

28b Stem short, pithy, often attenuated downwards. Pileus white, brown, or with a lilac tinge. In meadows or fields amongst grass 32

29a Pileus ovato- or campanulato-convex, not turning yellow when touched. Flesh smelling like Lepiota cristata. Late species 30

29b Pileus more plano-convex, turning more or less yellow. Smell slightly acidulous. Early species 31

30a Ring simple. Pileus nearly smooth. In coniferous woods in Denmark. Pileus 4—7 cm., campanulate, then plano-convex with conspicuous broad umbo, white with alutaceous tinge, nearly smooth or slightly floccoso-squamulose. Gills with a vivid rosy flesh colour when unfolding. Stem 8—10 × 1,2—2 cm., tapering upwards from the somewhat clavate base, white, but becoming flesh colour downwards. Ring very shortly, white. Flesh white, flesh colour when broken, towards the base ochraceous to tawny. Smell disgreeable. Basidia 4-spored. Spores 6—8 × 4,5—5 µ. (Psalliota altipes Moeller, Friesia 4: 46, 1950, fig. 9.)
Agaricus altipes (MOELLER).

30b Ring with double edge. Pileus squamulose. In deciduous woods in Denmark. Pileus 4—7 cm., ovato-campanulate, then convexo-expanded, white, often pale tan in the middle, densely floccoso-squamose with sparse, concolorous, pointed, adpressed scales. Gills at first a beautiful rose colour, with fertile edge. Stem 5—10 × 1,5—2,5 cm., attenuated upwards, white, often with a rosy tinge above the ring, naked, turning yellow below the ring when touched. Flesh white, slightly flesh-coloured. Smell disagreeable. Spores 7—8 × 4,5—5 µ. Basidia 4-spored. (Psalliota decorata Moeller, Friesia 4: 48, 1950, fig. 10.)
Agaricus decoratus (MOELLER).

31a Pellicle becoming faintly yellow when touched. Pileus 5—10 cm., shining, white, with sulphureous tinge when touched, with delicate, adpressed silky fibrils, with age showing in places small, adpressed scales. Gills at first bright rosy flesh colour. Stem 4—9 × 1,5—3 cm., cylindrical or attenuated upwards, white, becoming yellow when touched, often rosy at the apex. Ring thin, fugacious, simple. Flesh rather thin, white, light rose-coloured in the upper part of the stem. Smell weak. Spores 6—8 × 4—4,5(5) µ. Basidia 4-spored. Gregarious in coniferous woods, often under Abies in Denmark. (Psalliota aestivalis Moeller, Friesia 4: 50, 1950.) *Agaricus aestivalis* (MOELLER).

31b Pellicle becaming vividly yellow. Spores 6,5—8 × 4—5 µ. Gregarious in coniferous woods, sometimes under Fagus, in Denmark. *Agaricus aestivalis* (MOELLER) var. *flavotactus* MOELLER l. c.

32a Pileus dark (brown or grey), often with a lilac tinge . . 33

32b Pileus lighter coloured 35

33a Spores 6 × 4—5 µ, ovato-globate. Pileus violet grey, 5—6 cm., lightest on the disc and there with few, small, dark grey, adpressed scales, radially striate with innate fibrils. Gills at first bright flesh pink. Stem 4—5 × 1,2—1,5 cm., somewhat thinner towards the base, whitish at first, then turning grey, finally tawny at base. Ring narrow, fugacious, simple. Flesh whitish with a faint reddish tinge, especially at the top of the stem, dirty yellow at the base. Smell weak, slightly acidulous. Gregarious among bushes in Denmark. (Psalliota livido-nitida Moeller, Friesia 4: 51, 1950.)
Agaricus livido-nitidus (MOELLER).

33b Pileus brownish red or dark brown with a lilac tinge . . 34

34a Pileus porphyry brown, smooth, fibrillose and more or less darkly squamulose, 4—6 cm., semiglobate, then plano-convex, with darker centre. Gills at first vivid "campestris" red. Stem thicker downwards, 3—5 × 1,5—2 cm., bulbous or subfusiform, white, porphyry-coloured at the base, floccosely fibrillose below the ring, which is white, narrow, simple. Flesh white, when broken faintly flesh coloured. Smell weak, acidulous. Spores egg-shaped, 5—7 × 3,25—4,5 µ. Basidia 4-spored. Gregarious

in meadows in Denmark. (Psalliota porphyrea Moeller, Friesia 4: 53, 1950, t. IVc.) *Agaricus porphyreus* (Moeller).

34b Pileus lilac or purplish brown, floccoso-squamulose, 5—7 cm., semiglobate, then convex, with depressed centre. Gills bright "campestris" red. Stem 3—4 × 1—1,5 cm., often thinner downwards, white with flesh coloured top, under the ring floccoso-squamulose at first, then smooth. Ring thin, narrow, simple. Flesh white, when broken slightly rubescent. Smell weak, acidulous. Spores egg-shaped, 7—9 × 4—4(5) µ. Gregarious in meadows in Denmark and Germany. Basidia 4-spored. (Psalliota campestris var. cupreo-brunnea Schaeff. et Steer, Schaeffer, Michael, Fuehrer f. Pilzfr. I, p. 147, 1939, Deutsche Blätter f. Pilzk. 3: 5, 1941. — P. cupreo-brunnea [S. et S.] Moeller, Friesia, 4: 54, t. IVb, XVI. 1950.)
Agaricus cupreo-brunneus (Schaeff. et Steer) n. c.

35a Pileus white, sometimes turning a little yellow 36

35b Pileus argillaceous or white, with brown scales or fibrils 38

36a Pileus 5—8 cm., white, densely floccoso-squamulose. Gills broad. Spores 7—8 × 4—5 µ. *4. Agaricus campester* Fr. ex L.

36b Pileus 3—5 cm., nearly smooth, white, turning yellow when touched. Gills rather narrow. Spores 6—7 × 4—5 µ . . . 37

37a Stem ca 1 cm. thick, smooth above the ring. Flesh thin.
Agaricus campester var. *equester* (Moeller 1950).

37b Stem 1—2 cm. thick, above ring floccoso-squamulose like Hebeloma. Flesh thin and firm
Agaricus campester var. *floccipes* (Moeller 1950).

38a Pileus 4—8 cm., white with dark brown fibrils. Stem stout, rather tall. Spores 7—8,5 × 5—6 µ.
Agaricus campester var. *fusco-pilosellus* (Moeller 1950).

38b Pileus 3—4 cm. with sparse, small, flat, brown scales. Stem short. Spores 7—8 × 4—5 µ 39

39a Pileus with white back-ground. Stem 1—1,75 cm. thick.
Agaricus campester var. *squamulosus* Rea.

39b Pileus with argillaceous ground. Stem 1 cm. thick.
Agaricus campester var. *isabellinus* (Moeller 1950).

Subgenus *Melanophyllum* (Vel.)

1. **Agaricus haematospermus** Bull. 1793.

Synonymia:

Lepiota haematosperma (Bull.) Boudier 1901; Bataille 1902, Lange 1935.
Psalliota haematosperma (Bull.) Lundell et Nannfeldt 1935.
Agaricus echinatus Roth 1800, Fries 1821.
Lepiota echinata (Roth.) Quél. 1886, Konrad et Maublanc 1924.
Psalliota echinata (Roth.) Quél. 1875.
Inocybe echinata (Roth.) Saccardo 1887.
Agaricus fuscopurpureus Lasch 1828.
Melanophyllum Canali Velenovský 1921. — Diagnosis latina: Velenovskýi Species Novae Basidiom. p. 219, 1948.

Pileus in youth campanulate-conical, then expanded, with a blunt tubercle, often radially wrinkled, brown to blackish brown, covered with floccosely verrucous, fine granules, finally squamose, at the margin with fragments of the velum, 1,5—3 cm. in diameter, thinly fleshy.

Gills dark purply red, finally brown to almost black, ventricose, rounded at the stem, in old age wrinkled on the surfaces.

Stem purply red, with floccosely membranaceous ring, which is sometimes lacking when it hangs in the form of detached fragments at the margin of the pileus; under the ring pale loam-coloured floccosely pulverulent, at the tip bare, dark red, at the base almost black, subcylindrical, 40—60 × 2—5 mm., with a tubular hollow inside.

Flesh pale, at the surface of the stem purple red, smelling of cucumber. Scent not striking. Not poisonous according to the literature.

Spores elongated ellipsoid, long subhyaline, then yellowish brown, smooth, 4—5 × 2—3 µ. Sporee smoke-coloured, often with a purple tinge, much lighter than in other species of the genus Agaricus. Velum universale of globular cells, 30—40 µ in diameter.

Hab. In gardens and in woods among decaying leaves or among fragments of wood, fairly rare, September to November. In Czechoslovakia it has been found several times. In the oak woods at Mouchnice near Koryčany in Moravia collected by Sladký, IX-1918. I myself found it in the deciduous woods on a limestone substratum at Karlštejn, 27-VII-1944. In the park "Stromovka" in Prague, 24-IX-1935, collected by Dr. Herink

Agaricus haematospermus Bull. is not a typical representative of the genus *Agaricus*. It differs from it essentially in the shape and coloration of the spores as well as by the smell of the flesh and a number of other characters. Therefore it was placed in different genera, most frequently in the genus *Lepiota*, but also in the genus *Inocybe*. Velenovský established for this species the new genus *Melanophyllum* Vel., which I think is justified. It belongs of course to the close affinity of the genus *Agaricus*, and in our monograph we placed *Melanophyllum* therefore as a subgenus to the genus *Agaricus*.

Subgenus *Euagaricus*.

Sectio 1: *Rufescentes* J. Schaeffer

2. **Agaricus edulis** (Vitt.) Moeller et J. Schaeffer. (Tab. IV.).

This interesting fungus belonging indubitably to the close affinity of *Ag. campestris* was found up till now in Czechoslovakia only on the rubbish-heap at the castle at Smiřice n. L., whence Mr. J. Nitka brought it twice to me. Specially beautiful, but I received only young receptacles 31. 7. 1944.

It is a pure white and hard fungus, whose velum universale is strongly developed and leaves behind on the lower part of the stem an ochrea with a turned-up margin, so that the base of the stem is surrounded as if by an adnate sheath. For the rest it is rather reminiscent of *Ag. campester*. Spores rounded, 4—6 × 4—5 µ. Very good edible fungus.

Synonymia: *Ag. campestris A edulis* VITTADINI, *Ag. bitorquis* QUÉL., *Psalliota peronata* RICHON-ROZE, ? *Ps. duriuscula* RICHON-ROZE, *Chitonia Pequinii* BOUDIER, *Ps. campestris* var. *alba* BRES. t. 824 et var. *edulis* VITT. t. 825, *Chitonia edulis* (VITT.) HERRFURTH, *Psalliota Rodmani* PECK sec. GÜSSOW et ODELL. et sec. A. H. SMITH.

J. SCHAEFFER published a good description in the Annales Mycologici 36 : 75—77, 1938, and in MICHAEL-HENNIG-SCHAEFFER, Führer für Pilzfreunde, t. 49. Vid. also HERRFURTH: Chitonia edulis Vitt. in Schweizerische Zeitschrift für Pilzkunde 1933, pp. 100—107. I myself have seen only young receptacles, therefore the description given below is in part according to the literature: The young receptacles are entirely enveloped by the velum universale, so that they look like the receptacles of some white species of the genus *Lycoperdon*.

P i l e u s thickly and firmly fleshy, 3—15 cm. in diameter and up to 2,5 cm. thick, white or slightly yellowish, sometimes also turning slightly yellow, smooth and glabrose, more rarely fibrillose, only in its earliest youth often covered with the membranaceous remains of the velum universale (except the margin), at first flat hemispherical, then arched with a flat apex which later may be depressed, with a broadly involute to sharply bent margin.

G i l l s flesh pink to chocolate, at the edge slightly white floccose, rather narrow.

S t e m in youth white, later at the tip darker and in the lower part often rusty, cylindrical, often slightly pointed at the base, relatively short and thick, firmly fleshy.

Velum universale connected with velum partiale and adnate to the base of the stem, where it forms the adnate sheath or ochrea distant at the upper margin with a small border, and sometimes torn into one or two zones; above the border a curly white ring is adhering.

F l e s h white, colouring when cut slightly flesh rusty, of pleasant smell like freshly felled pine wood and of hazel-nut taste. With aniline oil it colours intensively blood red.

Cheilocystida clavate, on the whole not striking.

S p o r e s rounded, 4—6 × 4—5 µ.

Hab. On rubbish-heaps, especially at houses and in towns, sometimes also between paving-stones in streets, and the receptacles sometimes even break through the asphalt pavement. It appears already in May. It was collected in Czechoslovakia only once, at Smiřice n. L., in Germany according to J. Schaeffer it is not rare. It grows in the same locality for several years and usually produces many receptacles.

MOELLER (1950) described var. *validus* (MOELLER): "A typo differt statura robustiore (pileus 10—15 cm), carne fracta distincte incarnata. Caespitosa, in pratis pinguibus Daniae, mense Augusto."

U t i l i s a t i o n: Excellent edible fungus. The receptacles are very persistent, compact and firmly fleshy.

It is identical with the American species *Agaricus Rodmani* PECK. It was also first well described under this name and is best known under it in literature. A. H. SMITH (The Genus Agaricus, Pap. Michig. Ac. 25 : 130, 1949) prefers this name to the old and uncertain name

of VITTADINI, which J. SCHAEFFER used. A good photograph has been published by HOTSON & STUNTZ (Mycologia 30 : 230, 1938).

G. F. ATKINSON: Morphology and Development of Agaricus Rodmani, Proc. Am. Phil. Soc 54 : 309—342, 1915, discussed expertly the morphology and development of the receptacles.

Because of its striking velum universale this species was placed in the genus *Chitonia* and described as *Chitonia Pequinii* BOUDIER and later as *Chitonia edulis* (VITT.) HERRFURTH. For a more detailed account of this species cf. SCHAEFFER, Zeitschrift für Pilzkunde 11 : 68—75, 1932, figure ibid. 16 : t. 17 (18), 1931; BUCHS ibid., 17 : 67—68, 1933; J. SCHAEFFER, ibid., 17 : 63, 1933. BR. HENNIG: Zwei seltenere Pilzarten 1932 in der Mark gefunden. Verhandl. des Botan. Ved. der Prov. Brandenburg 74 : 185—188, 1932—33.

Related is *Clarkeinda cellaris* BRES., t. 834, which differs by its larger spores (8—11 × 6—7 µ).

3. Agaricus Bernardii (QUÉL.) SACC.

Synonymia: *Psalliota Bernardii* QUÉLET 1878 (non RICKEN = *Ag. Beneši* PILÁT). KUČERA: Pečárka Bernardova — *Psalliota Bernardii* QUÉLET. — Čas. čs. houbařů 4:119—120, fig. 43, 1924.
Agaricus campester subsp. *Bernardii* (QUÉL.) KONR. & MAUBL.

P i l e u s in youth pure white, later slightly grayish, at the apex slightly dirty yellowish, smooth, velvety fine, in dry weather cracked, thickly fleshy (2—2½ cm.), first spherical, finally convex, with long involute margin, and at the margin with an exceeding cuticle and decorated with fringy remnants of the velum, 12—14 (—20) cm. in diameter.

G i l l s very crowded, grayish flesh coloured, then brownish violet, broken around the margin, free.

S t e m short, clavate, at the base ending almost conically radiciform, coarsely squamose around the bulb, white, firm, full, barely hollow in old age.

Ring thick, coriaceous, tightly stretched, fringy at the margin.

F l e s h white, turning rusty when cut, tough especially in the stem, of sweetish taste and unpleasant smell.

Hab. Sporadic and in mass, always outside the forest on grassy slopes and meadows, from summer to autumn.

Description after J. Kučera l. c., who compiled it from specimens which he had found in Bohemia at Belčice ("Záluží") below the village pond, 1. VIII. 1922 (12 very stately specimens). According to Kučera's report it was found also by Maximovič at Žehušice and by Donát at Chvojenec.

Kučera's figure (a pen-and-ink drawing) is published in Kučera's paper mentioned above. It agrees well with the description and corresponds also to Quélet's original description. Unfortunately Kučera does not mention the spores, as he did not study the fungus under the microscope.

The coloured figure of *Agaricus Bernardii* QUÉL. was published in the journal "Mykologia" 2: 47—49, after DVOŘÁK's coloured figure

made after specimens which he found at Hořice in the piedmont of the Giant's Mountains. A pen-and-ink drawing of this species is reproduced in the book by BIGEARD et GUILLEMIN, 2 : 268, 1913, and agress well with the coloured plate of DVOŘÁK, so that presumably all fungi mentioned are conspecific.

REA'S *Psalliota Bernardii* is however apparently different, as it is said to have the spores 9—11 × 5,5—6,5 µ. It is probably conspecific with *Agaricus urinascens* J. SCHAEFFER. QUÉLET'S *Psalliota Bernardii* is said to have ellipsoid, subglobose spores, 8 µ, uniguttulate, reddish brown. Quélet writes that it grows in spring in western France in grassy places moistened by salt-water.

MOELLER described this species from Denmark very well (Friesia 4: 14, 1950), where it grows in well-developed fairy rings, killing the grass, in meadows near the shore — rather uncommon — in July-October.

Pileus 8—15(20) cm., firm and remarkably thick-fleshed, semiglobate then with flattened centre, white, when old often with a purplish gray or argillaceous tinge becoming reddish when touched. The pellicle and the underlying flesh very soon breaking up into large, more rarely small, thick, areolate scales between which the slightly lighter-coloured flesh is visible. Gills very narrow, pale greyish flesh colour, finally blackish brown. Stem short, 5—7 × 2,5—4 cm, often subfusiform, solid, whitish, the lower half of the stem as a rule with an ochraceous scaly zone or a rudimentary, membranaceous, erect lower ring. Flesh exceedingly thick, firm, white, when broken immediately turning vividly purple in the stem and partly in the cap. Smell at first unpleasant, fishy — other observers call it carbolic-like. Spores ovately round 5,5—7 (10) × 5—6 µ. Basidia 4spored. Cystidia clavato-fusiform or cylindrical, hyaline, finally brownish, 24—56 × 5—16 µ.

The fishy smell and the rubescent flesh are characteristic of this species. It is not poisonous and is often eaten. But many people have a distaste for it, on account of the unpleasant smell, which some regard as carbolic-like. It is also indigestible because the flesh is firm and often tough especially when old. It is better, as done by people from the neighbourhood of Frederiksvaerk to use only the juice. *Agaricus Bernardii* QUÉL. is nearly allied with *Agaricus ingratus* MOELLER and also with *Agaricus Pequinii* BOUD., which—teste Moeller—also belongs to this group.

4. **Agaricus campester** FR. ex L. (Fig. 1—6, 58a).

Synonymia: *Pratella pratensis* sensu GILLET 1878 non FR.
Agaricus campester subsp. *albus* (BERK.) KONTR. & MAUBL.
? Psalliota exserta VIVIANI sensu BRESADOLA, Ic. Myc. t. 828, 1931.

Pileus 5—10 cm. in diameter, rarely larger, in youth subglobose, rather higher than broad, never so flattened as in Ag. hortensis, then subcampanulate-convex and at the apex generally a little flat, finally almost flat-expanded; in youth pure white, smooth and silky-fibrose, often at the margin slightly pinkish from the flesh shining through, then often a little dirty yellowish and then there are found on the surface slightly brownish fibres, which form slightly to more strongly

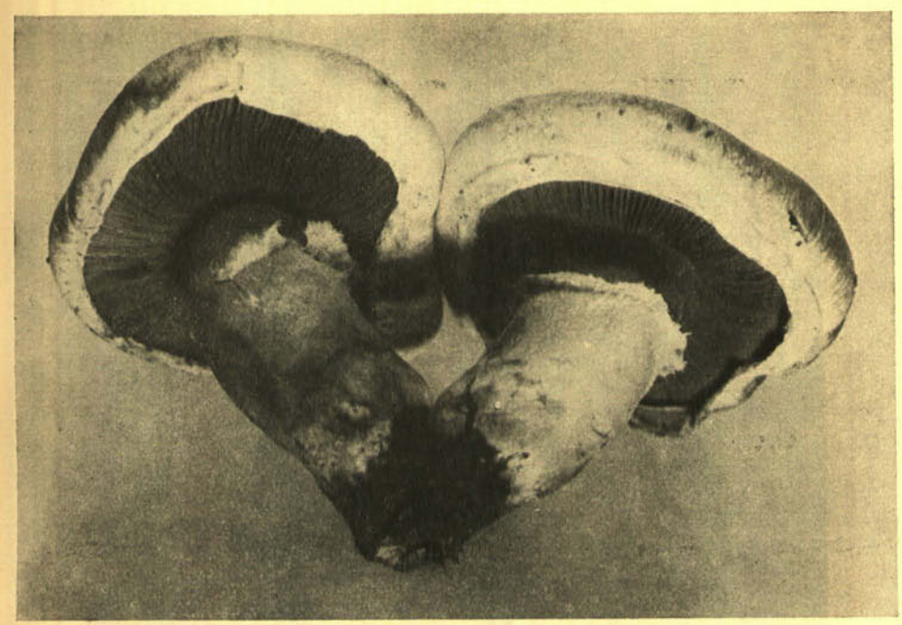

Fig. 1. *Agaricus campester* FR. ex L. Photo A. Pilát.
Bohemia: Kocába, 1. X. 1950, in prato, leg. Dr. Dostál. 1/1 orig.

brownish, minute and larger, adhering and adpressed squamules, in maturity, especially in dry weather, it cracks first radially and then almost over the whole surface into coarse and deep squamae, at the apex often areolate.

Gills in youth beautifully rose and in a fresh state long flesh red, then chocolate brown to almost black, and in this stage often deliquescent beginning from the edge, mostly about as broad as the flesh of the pileus is thick, on the edge only in youth slightly lighter, otherwise concolorous.

Stem cylindrical, usually rather short, rarely longer than the diameter of the pileus, generally not too thick (3,5—5 × 1—1,5 cm.), without a bulb at the base, rather attenuated, white, glabrose, smooth and full, sometimes the rosy flesh shines a little through the cuticle of the stem; then darker and dirty, at the base even brown or rusty brown, a little above the middle with a white, thin ring of one layer which adnates upwards, is thinly membranaceous and soon flaccid and hanging down as with the opening out af the pileus it tears and its remnants hang down in the form of white, irregular tatters at the margin of the pileus. Sometimes we find below the ring on the lower part of the stem indistinct zones which are remnants of a badly developed velum universale. Stem at the base without mycelian fascicles, rather firmly grown into the soil.

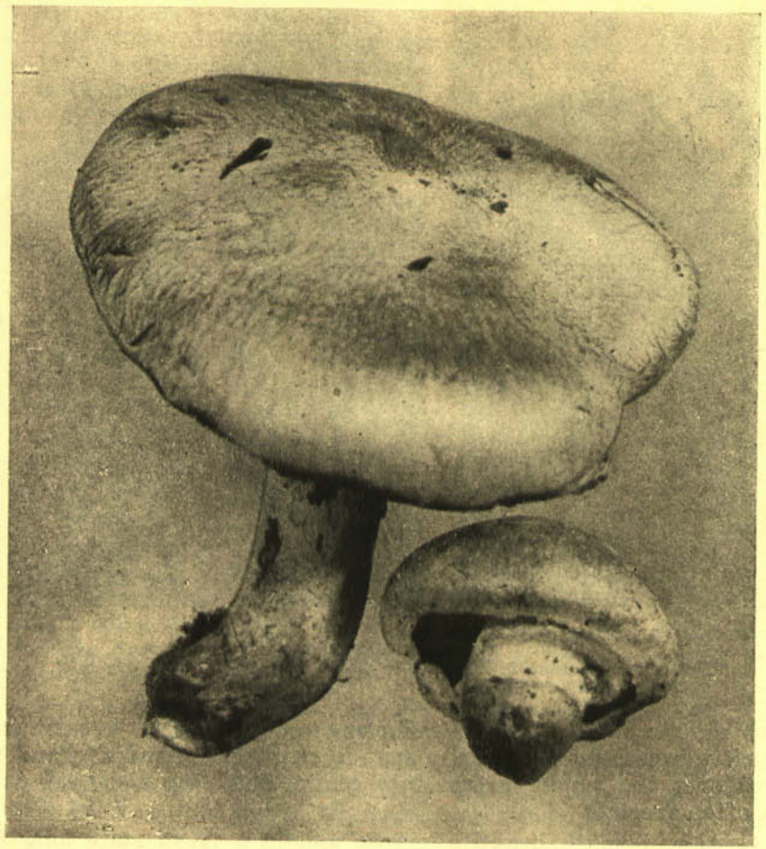

Fig. 2. *Agaricus campester* Fr. ex L. Photo A. Pilát.
Bohemia: Kocába, 1. X. 1950, in prato, leg. Dr. Dostál. 1/1 orig.

Flesh white or pinkish watery, especially beneath the cuticle of the stem, colouring when cut generally slightly, more rarely fairly intensively flesh pink, above the gills and at the limit between stem and pileus often grayish and at the base of the stem slightly orange, of pleasant smell (according to J. Schaeffer like plums or like freshly felled pine wood), and of very pleasant mushroom taste.

Spores ellipsoid, 7—10 × 5—6 µ. Basidia tetrasporic. Cheilocystida on the edges of the gills only in youth and even then very sparse and unstriking, pyriform, 7,5—11 µ thick soon fugaceous.

Hab. Among the grass in meadows, especially in those manured with liquid manure, in ditches along roads, in gardens, etc. (not on rubbish-heaps, dust-heaps and similar places almost without vegetation), abundant from summer to autumn.

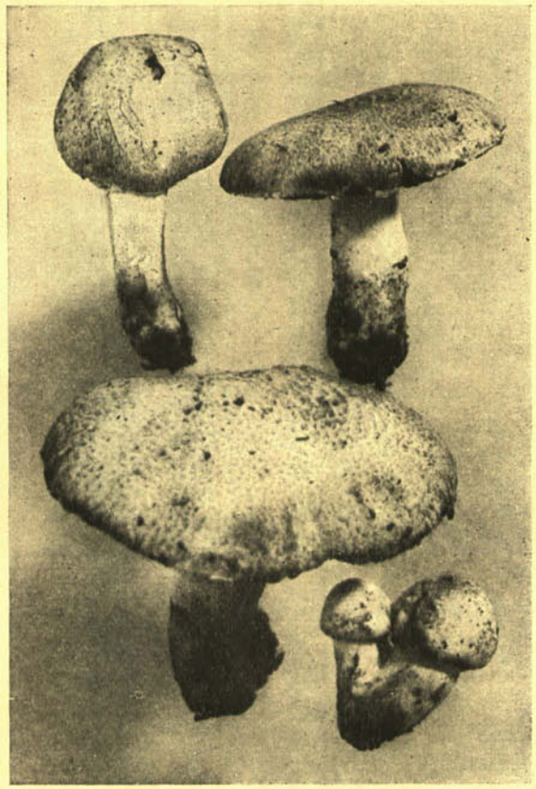

Photo A. Pilát.

Fig. 3. *Agaricus campester* Fr. ex L.
Bohemia: Karlštejn-Boubová, ad viam in gramine ad silvae marginem, 15. IX. 1950, leg. A. Pilátová. 2/3 orig.

Utilization: Excellent edible mushroom, slightly less fleshy than Ag. hortensis.

Agaricus campester has been generally considered the mother species, from which the bisporic mushrooms were formed by cultivation. This opinion is incorrect. *Agaricus campester* is not cultivated, at least as far as I have been able to convince myself. It would be scarcely possible to cultivate *Agaricus campester* under the conditions under which the two species *Agaricus hortensis* Cooke and *Agaricus bisporus* Lange are cultivated, as *Agaricus campester* is not so markedly coprophile as the two species mentioned. By its biology it differs considerably from these two species, and thus I cannot understand how these three and still other, quite different species from a morphological and biological point of view, could be confused in scientific and practical literature as one species or as "sorts" of one species. *Agaricus hortensis*

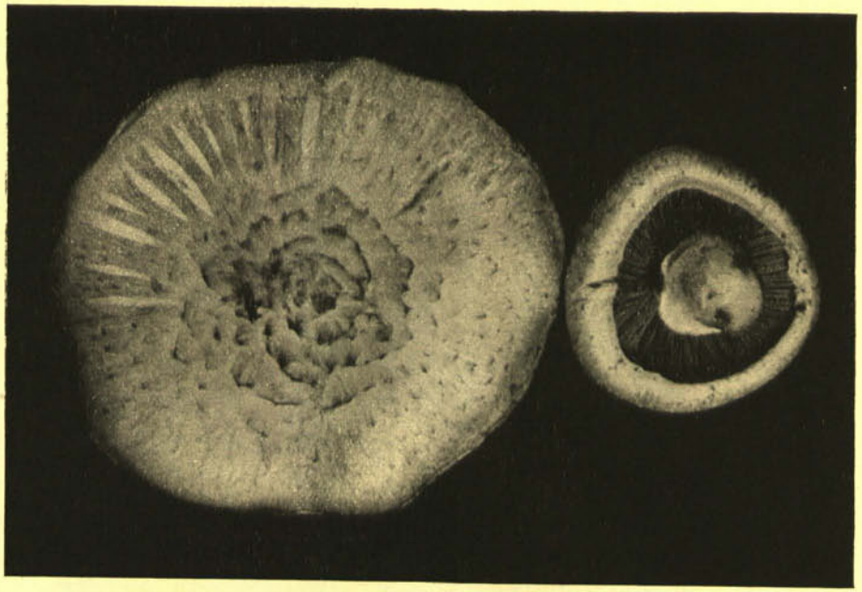

Fig. 4. *Agaricus campester* Fr. ex L. Photo A. Pilát.
Bohemia: Praha, 4. XI. 1942, leg. Dr. J. Herink. 1/1 orig.

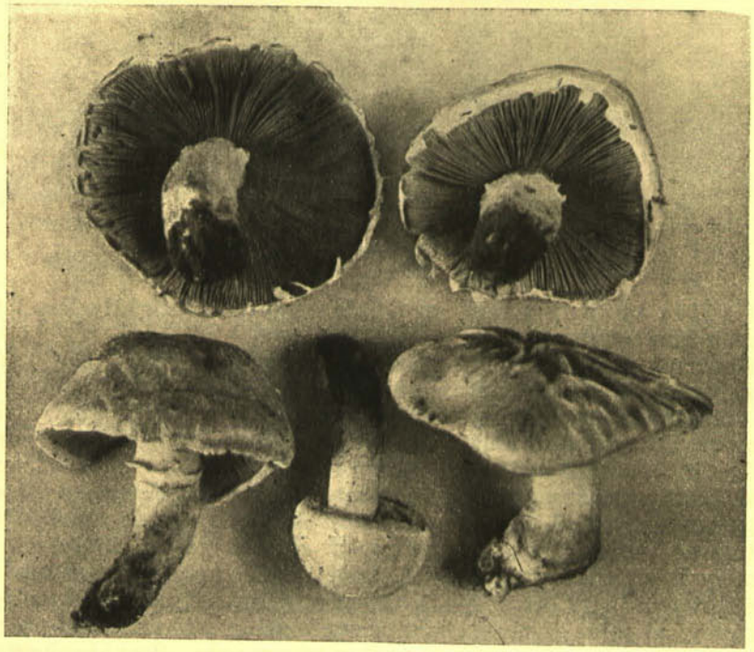

Fig. 5. *Agaricus campester* Fr. ex L. Photo A. Pilát.
Bohemia: Černolice prope Dobřichovice, in horto meo loco graminoso,
20. VII. 1950, leg. A. Pilát. 2/3 orig.

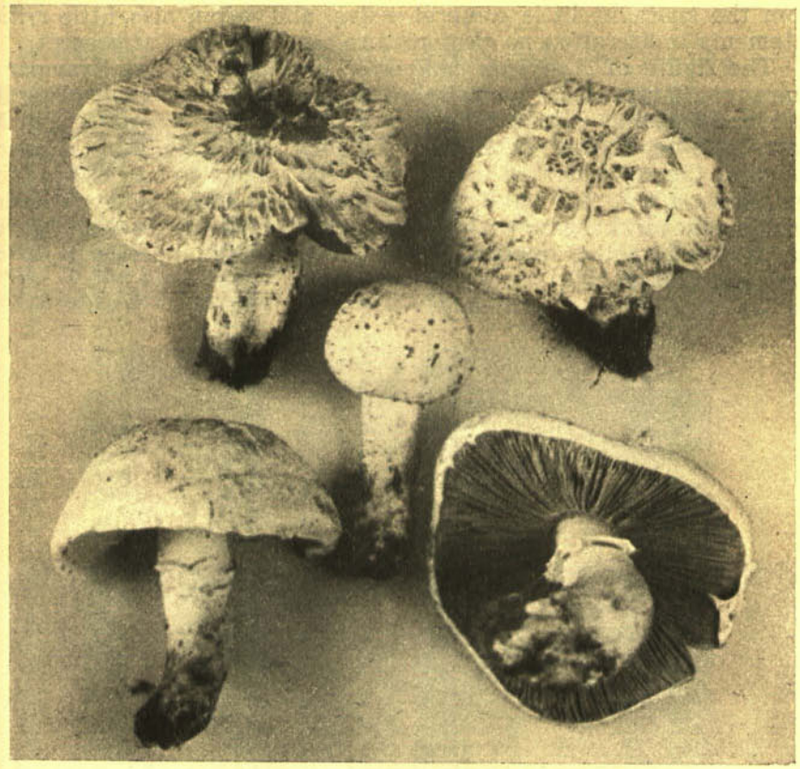

Fig. 6. *Agaricus campester* Fr. ex L. Photo A. Pilát.
Bohemia Černolice prope Dobřichovice, in horto meo loco graminoso,
20. VII. 1950, leg. A. Pilát. Specimina Iove arido evoluta. 2/3 orig.

and *Ag. bisporus* do not grow among the grass in meadows as *Ag. campester* does. Where I saw them, they grew on soil without vegetation, on rubbish-heaps, on compost, on manured fields especially in potatoes and turnip, and perhaps also on soil rich in nitrogen washed together in forest nooks. Both these species grow wild in our country and d i d n o t f o r m through cultivation, as is sometimes asserted. They were taken over into cultivation from nature and did not change by cultivation. Receptacles of *Agaricus hortensis* Cooke, cultivated in the dark, differ of course sometimes a little in their exterior — they are pure white —, which is quite natural, but when we transfer the mycelium into the open it produces normal receptacles as in nature, i. e. from the apex rusty brownish and only towards the margin white.

To the affinity of *Agaricus campester* belong evidently still several other, weak species or races which I have not seen, and it will still take a long time before this specific circle will be adequately studied.

From the sporadic, little comprehensive and often also little critical statements in literature no clear picture can be formed at present.

The figure of *Agaricus campester* in FRIES, Aetliga Svampar V, is strange. It represents a small, brown squamulose fungus looking like *Agaricus bisporus* LANGE. The figure of *Psalliota campestris* in MICHAEL-HENNING-SCHAEFFER, Führer für Pilzfreunde No. 47 is *Agaricus hortensis* COOKE cultivated in the dark. BRESADOLA's plate 823 is fairly good, but on the side he figures monosporous and bisporous basidia which are not in keeping with it, and perhaps the microscopic figuring was made of another receptacle belonging to the species *Agaricus hortensis* COOKE.

Photo A. Pilát.

Fig. 7. *Agaricus hortensis* COOKE.
Bohemia: Praha XVI, U dívčích hradů 12, ad terram nudam, excrementis gallinaceis permixtam, 10. IX. 1950, leg. A. Pilátová. ⅔ orig.

5. Agaricus hortensis (COOKE). (Fig. 7—17. Tab. V—VI.)

Synonymia: *Agaricus campester* var. *hortensis* COOKE, Ill. Br. Fgi. t. 527. — *Psalliota arvensis* var. *hortensis* (CKE) W. G. SM. — REA B. B. p. 84. *Psalliota hortensis* COOKE f. *albida* LANGE. Fl. Ag. Dan. 4 : 58, pl. 140 E. — *Psalliota campestris* var. *radicata* BRES. Ic. Myc. t. 827.

P i l e u s in youth plane-hemispheric, with the margin strong and long involute, white or dirty white, silkily fibrose, later plane-hemispheric with a flat apex, in maturity completely plane to slightly depressed in the middle, and only at the margin a little arched, relatively thick fleshy. Margin white tomentose-membranaceous,, exceeding the

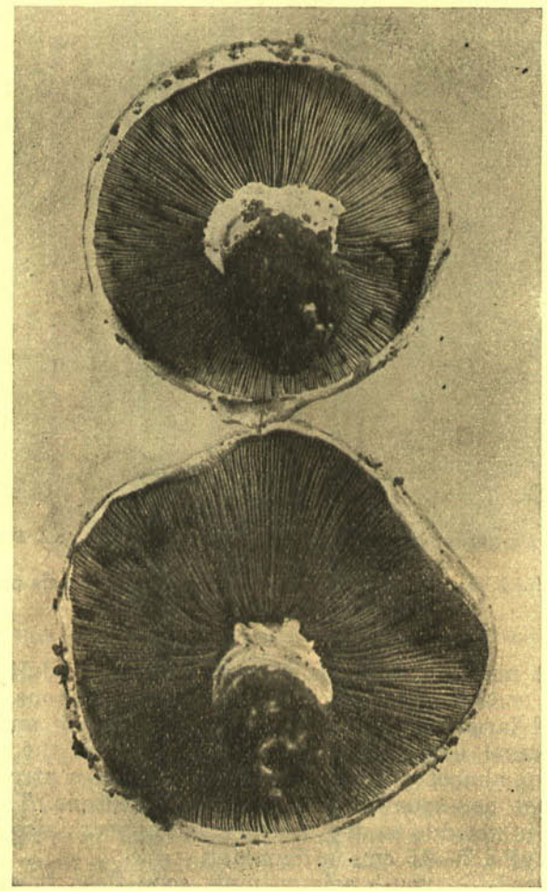

Photo A. Pilát.

Fig. 8. *Agaricus hortensis* COOKE.
Bohemia: Praha XVI, ad terram nudam, excrementis gallinaceis permixtam, 10. IX. 1950, leg. A. Pilátová. ⅔ orig.

Photo A. Pilát.

Fig. 9. *Agaricus hortensis* Cooke.
Bohemia: Praha XVI, ad terram nudam, excrementis gallinaceis permixtam, 10. IX. 1950, leg. A. Pilátová. ¾ orig.

gills by up to 5 mm., on the apex in semi-adult and adult stage dirty brownish, with cuticle cracking into unstriking, fibrous, adpressed, quite small and larger squamules pale dirty brownish and sitting on a white background, especially in the middle third of the pileus; marginal third white, almost without squamules, and the centre connectedly brownish, almost non-squamose, only radially fibrous. This cracking into squamules is not due to dry weather and appears also in very wet weather. Adult pilei 7—15 cm. in diameter.

Gills already in youth salmon pink, soon flesh to grayish flesh coloured, finally flesh brown to black, crowded, broadest near the stem, curved in elegant s-shape, with whitish, lighter edge.

Stem short and relatively thick, especially in maturity, when it is much shorter than the diameter of the pileus and attains a size

Photo A. Pilát.

Fig. 10. *Agaricus hortensis* Cooke.
Bohemia: Praha XVI, ad terram nudam, excrementis gallinaceis permixtam, 10. IX. 1950, leg. A. Pilátová. ¾ orig.

of up to 6 × 3,5 cm., in youth 4—5 × 1,5—2 cm., cylindrical, almost not thickened in the lower part, but mostly at the upper end a little thinner than at the base, below without bulb and rounded, white, longitudinally silky to floccose fibrous, above the ring slightly furrowed, dirty reddish brown from the adhering spores (especially in maturity), at the base with scanty mycelian threads, sitting fairly free on the surface of the soil so that it can usually be turned over more easily than Agaricus campester.

Ring double, but not distinct. The lower part is connected by fibres with the lower part of the stem so that it derives from the velum

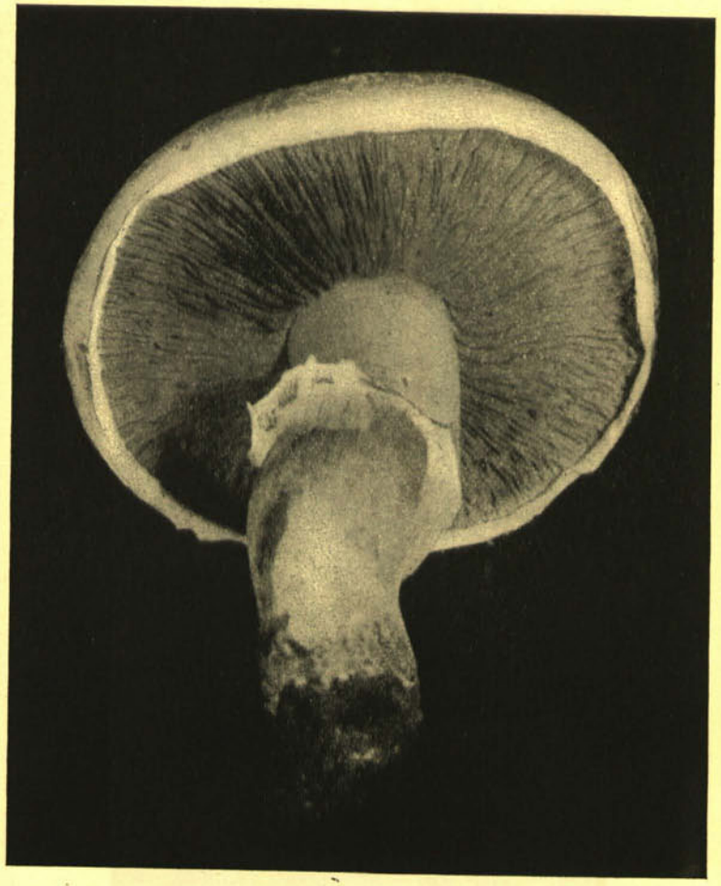

Photo A. Pilát.

Fig. 11. *Agaricus hortensis* Cooke.
Bohemia: Veltrusy, in tepidario e mycelio "Svit" J. Řezník coluit, 8. XI. 1950.
1/1 orig.

universale; the upper part is connected with the tip of the stem and derives from the velum partiale. The ring is relatively thin membranaceous to cobweb-like, white, on the underside cobweb floccose, on the upper side from the gills furrowed, soon rather flaccid and adhering to the stem and usually at the margin laciniolate or fringy.

Flesh in medium aged receptacles white with a slight wine-red tinge, especially at the surface of the tip of the stem in the middle of the pileus and above the gills. The red colouring changes after a while to reddish rusty. Otherwise the oxydation of the flesh does not proceed rapidly, and after a while it rather pales.

Pleasant mushroom smell, moderate mushroom taste. Flesh in the

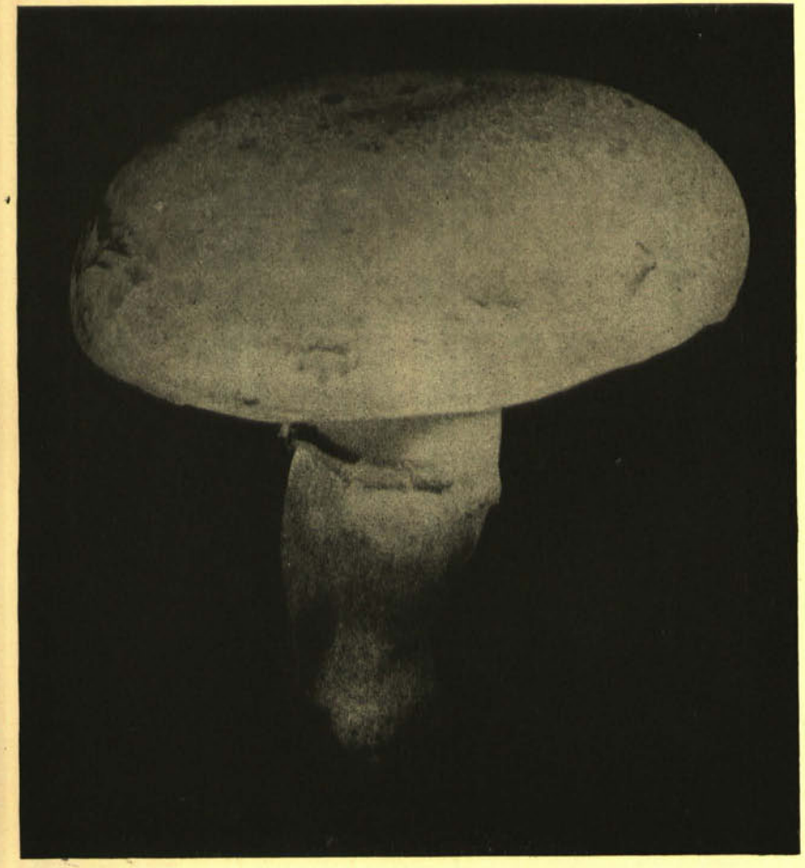

Fig. 12. *Agaricus hortensis* Cooke. Photo A. Pilát.
Bohemia: Veltrusy, e mycelio "Svit" in tepidario J. Řezník, 3. XI. 1950 coluit.
1/1 orig.

stem on the whole fibrous, in the middle cottony and here later disappearing so that the older stem has a narrow hollow

Basidia bisporic or monosporic.

Cheilocystida on the edge of the gills hyaline, thin-walled, rather resembling the basidia, clavate, rather abundant, 9—14 µ thick and 20—27 µ long.

Hyphes of the mediostratum of the gills thin-walled, parallel, with rather abundant dissepimenta, 8—9 µ thick.

Spores broadly ellipsoid, 7—8,3 × 5—5,5 µ.

Hab. In chicken-runs on the bare soil abundantly saturated with chicken dung. In my garden in Prague XVI — U Dívčích hradů 12, every year in a great number of receptacles. (This year 20. VII. 1950,

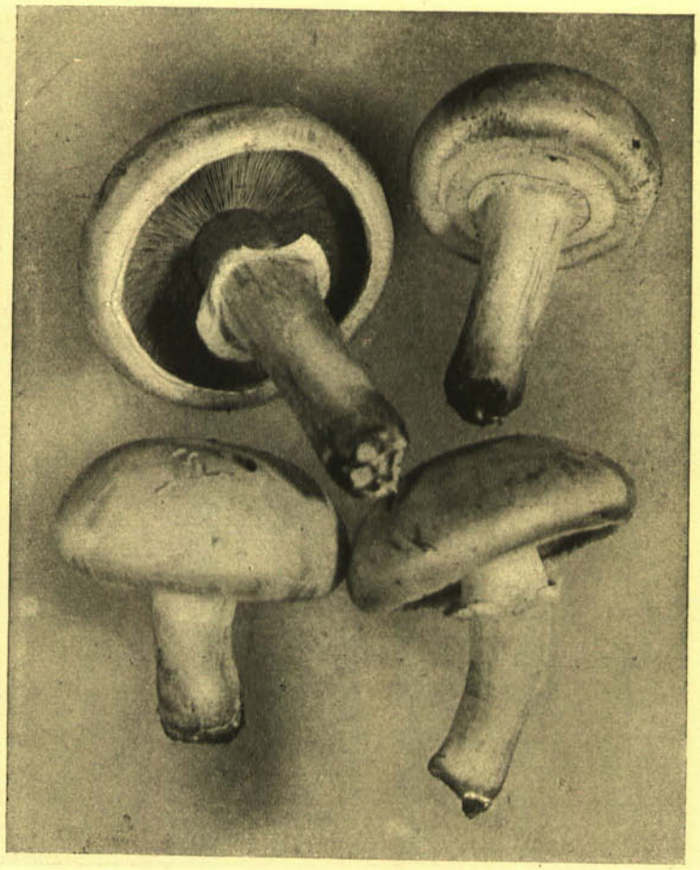

Photo A. Pilát.

Fig. 13. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, e mycelio "Svit", 24. X. 1950, culta.
Specimina iuvenilia. ¾ orig.

10. IX. 1950, 2. X. 1950, 18. X. 1950.) As far as I know nobody in the whole district cultivates mushrooms.

In free nature I collected this species near Karlštejn in the wood near the forester's house "Amerika". Here the receptacles grew on the loam of compost for the forest-nursery, composed of forest soil and manure. The receptacles grew on a thick layer of loam at the margin of the heap, which was bare, quite without vegetation. Basidia bisporic. Cheilocystida not striking, similar to the basidia, clavate, 8,5—15 × 35—45 µ, Spores short ovoid, 8—9 × 6—7 µ. The caps of young receptacles are white, at the apex dirty grayish brownish, absolutely the same as the fungi which grow in the chicken run in my garden in Prague.

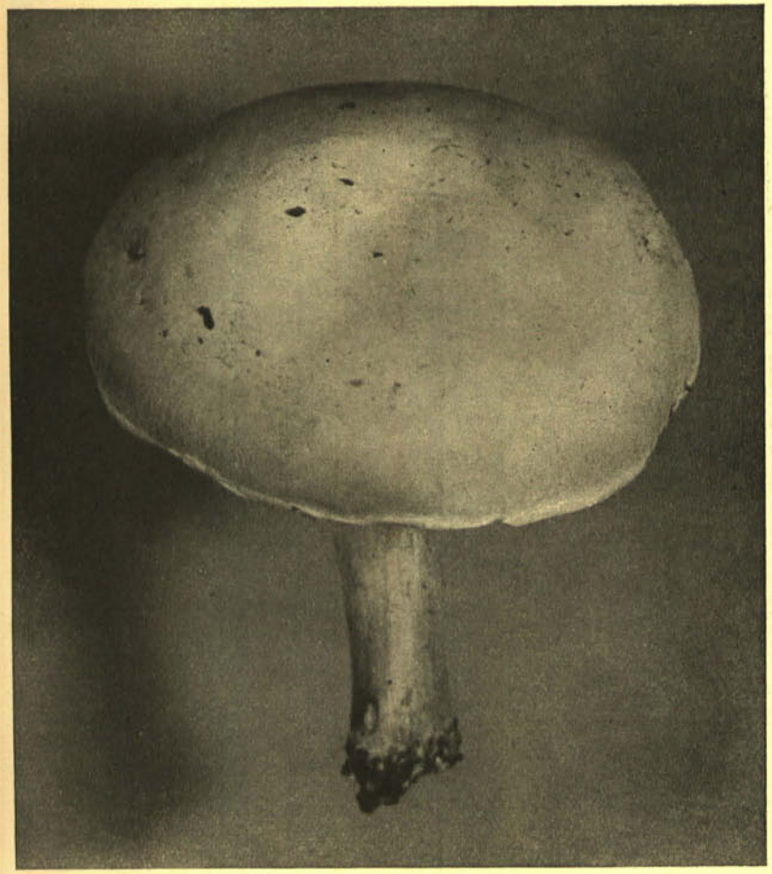

Fig. 14. *Agaricus hortensis* COOKE. Photo A. Pilát.
Bohemia: Praha-Troja, e mycelio "Svit", 24. X. 1950, culta.
Specimen semiadultum. 1/1 orig.

Agaricus hortensis COOKE is a good species and not only a form of *Agaricus compester* as it was described by COOKE, or of *Agaricus arvensis* where it is placed by REA. *Agaricus hortensis* is even a fungus from another section, which has nothing whatsoever in common with *Agaricus arvensis*.

Agaricus hortensis COOKE is closest to *Agaricus bisporus* (LANGE) MOELLER et SCHAEFFER, from which however it differs considerably as by its exterior it is rather reminiscent of *Ag. campester*. From *Ag. campester* it differs not only by morphological and anatomical features, but also by its biology, for it is an explicitly coprophile species which grows on bare soil strongly mixed with excrements and urine, whereas *Agaricus campester* grows among the grass in meadows, especially in

Photo A. Pilát.

Fig. 15. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, e mycelio "Svit", 24. X. 1950, culta.
Specimen semiadultum. 1/1 orig.

those places which have been sprinkled with urine or liquid dung. Just because it is a coprophile species it is easy to cultivate. Thus it is not a cultivated race of *Agaricus campester,* but a separate species growing wild in our country, from the close affinity of *Agaricus bisporus L.* To the species *Agaricus hortensis* COOKE belong very likely all the white, artificially grown mushrooms which I have seen up till now in Czechoslovakia.

In addition to this mushroom also a brown mushroom is cultivated, usually called "the Brown Mushroom". LANGE designates it *Psalliota hortensis* forma *avellanea* LANGE. This brown cultivated mushroom I have unfortunately not seen in recent years. As far as I can judge

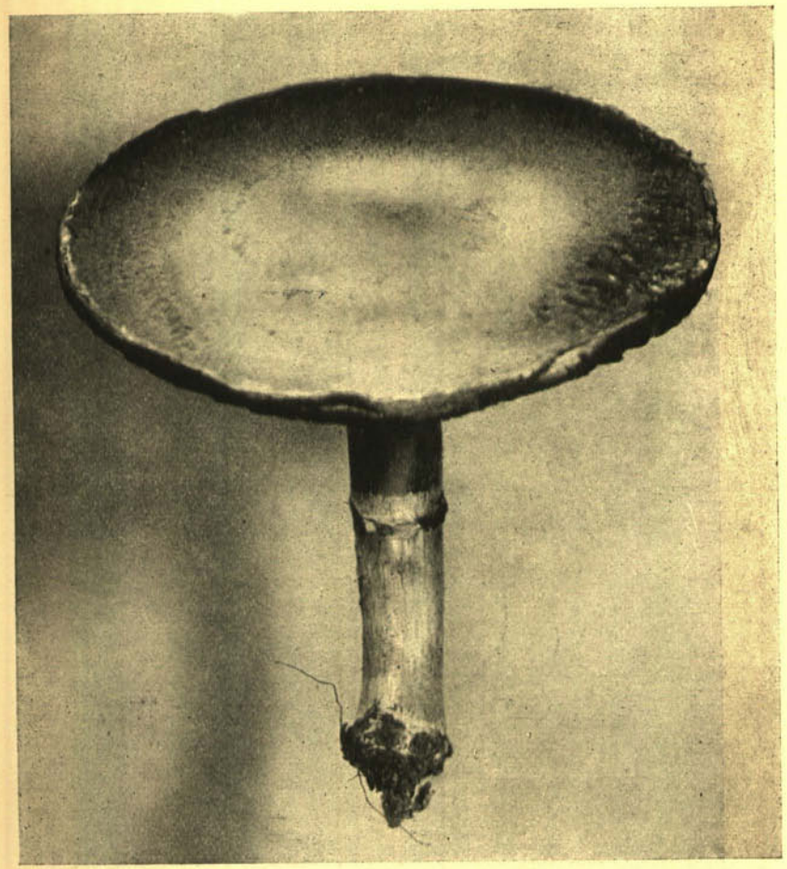

Photo A. Pilát.

Fig. 16. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, e mycelio "Svit", 24. X. 1950, culta.
Specimen adultum. ¾ orig.

from the descriptions in the literature and from the figurings it is nothing but *Agaricus bisporus* (LANGE) MOELLER et SCHAEFFER. It is a fungus which in its exterior differs macroscopically considerably from *Agaricus hortensis,* and which represents a good, differentiated species, which however has a biology very similar to that of *Ag. hortensis.* It is likewise a coprophile species growing also wild mostly on bare soil abundantly mixed with nitrogen substances, chiefly urine and excrements, therefore in ditches along the roads when they are not overgrown with grass, at the parking-places of horse vehicles, on strongly manured fields, especially among turnips etc., but never among grass as *Agaricus campester.*

Photo A. Pilát.

Fig. 17. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, e mycelio "Svit", 24. X. 1950, culta.
Specimen adultum. ¾ orig.

6. Agaricus bisporus (LANGE). (Fig. 18—19. Tab. VII.)

Synonymia:

Psalliota hortensis var. *bispora* LANGE, Studies VI, 1926.
Psalliota hortensis sensu LANGE, Fl. Agar. Dan. 4 : 58, t. 139 A, 1939 (non COOKE).
Psalliota bispora (LGE) SCHAEFFER et MOELLER, Ann. Myc. 36 : 69, 1938. — MICHAEL—SCHAEFFER—HENNIG, Führer für Pilzfr. t. 48.
Psalliota bohemica R. BENEŠ, Čas. čs. houbařů, 14 : 9—11, 80—81, 1934.
Psalliota praenitens sensu KUDRNA, Čas. čs. houbařů 2 : 246, non BECK.
Very likely belong to this species as synonyma after Julius Schaeffer:
Psalliota pratensis auct. ex. gr. BRESADOLA, Ic. Myc. t. 822, 1931.
Psalliota praticola auct.
Psalliota umbrina auct. (vix BRESADOLA).
Psalliota silvatica var. *latisquamosa* R. SCHULZ, t. 55.

Photo A. Pilát.

Fig. 18. *Agaricus bisporus* LANGE.
Bohemia: Kunratice prope Pragam, in horto ad terram compositam,
2. X. 1950. ½ orig.

Pileus 4—8 (10) cm. in diameter, pale to dirty brownish, sometimes to saturated dark brown, arched, but mostly flatter at the apex, bent down towards the margin, and involute at the margin, with the cuticle at the margin exceeding the gills and hung with usually irregularly denticulated remnants of the velum, usually compactly and rather thickly fleshy, with the cuticle usually smooth at the apex, mostly shiny towards the margin and radially fibrous to adpressed broadly squamose.

Gills rather narrow, narrower than the thickness of the flesh, in youth vivid flesh pink, on the edge whitish fringed.

Stem rather short, 3—6 cm. long and 1—2 cm. thick, white, smooth, glabrous, cylindrical, solid, later a little hollow, in youth slightly rufescent when cut on the surface and inside. Ring thick, but narrow,

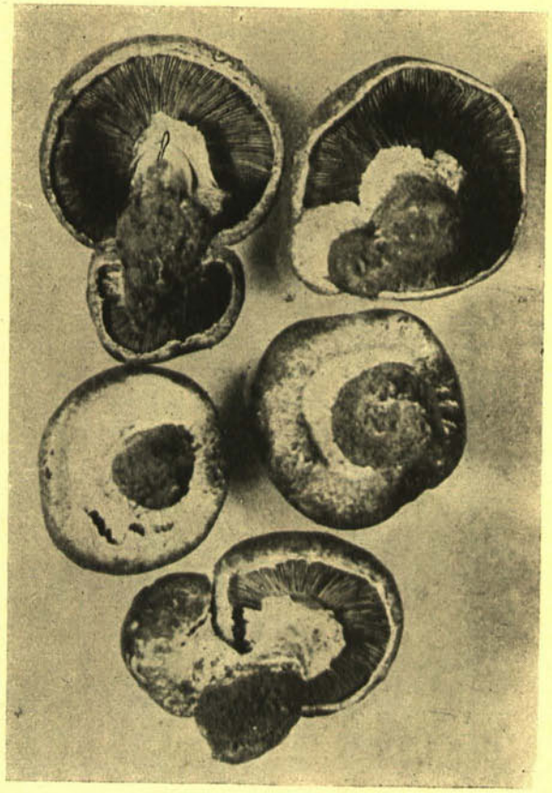

Photo A. Pilát.

Fig. 19. *Agaricus bisporus* LANGE.
Bohemia: Kunratice prope Pragam, in horto ad terram compositam, 2. X. 1950. ½ orig.

provided with a ledge not connected with the tip of the stem but with its base and therefore easy to peel below.

Flesh white, in a fresh state turning when cut pink to wine red (bruised places turn rather rusty), of pleasant smell — according to J. SCHAEFFER like freshly felled pine wood or like plums. With aniline oil it reacts a beautifully saturated blood red.

Spores broadly ovoid, 6,5—7,5 (10) × 5—6 (7) µ. Basidia bisporic, 25—30 × 6—7,5 µ. Cheilocystidia on the edge of the gills clavate, not striking, 8—10 µ thick.

Hab. on compost and in gardens, also in hothouses and in the woods on manured places, also in manured fields and meadows, often in great numbers and even tufted.

Fairly distributed, but not abundant. LANGE derives from it the cultivated bisporic sorts,

the form with brown coloured pileus he calls f. *avellanea* LANGE, the form with a white pileus he calls f. *albida* LANGE.

SCHAEFFER and MOELLER believe that *Psalliota subfloccosa* LANGE, which Lange described from spruce forests in Denmark, is a tetrasporic race of *Agaricus bisporus* LANGE. It differs essentially only by the tetrasporic basidia and by the only slightly smaller spores, 6,5 × 4 µ.

Agaricus bisporus grows sporadically in Czechoslovakia. Ing. Lukavec brought me beautiful specimens on 5. VI. 1950 from Lysá nad Labem.

In Mr. Josef Steckel's garden at Kunratice near Prague this fungus grew on compost composed of manure, peat and loam. After part of the compost was scattered it spread to several places in the garden. The receptacles appeared on 2. IX. 1950. They are typically developed, with the spores shortly ovoid, 8—9 × 5,5—6,4 µ. Basidia bisporic, 23—28 × 6,5—6,5 µ. Cheilocystidia globosely pyriform, up to 13 µ thick. The species grew wild and was not transferred by a mycelium from a cultivation.

Beneš collected it at Jizbice near Nymburk, 20. X. 1930, and described it under the name of *Psalliota bohemica* BENEŠ. KUDRNA determined this species as *Ps. praenitens* BECK (which is a synonymum of *Ag. augustus* FR.).

The fungus described by HOTSON and STUNTZ from western North America under the name of *Agaricus pratensis* SCHAEFFER must be very similar in its exterior, but it has slightly narrower spores, 6—8 × 4—5 µ.

Utilisation. Good edible fungus. One of the best species of mushrooms, but not so goodlooking as the receptacle of *Agaricus hortensis* COOKE cultivated in the dark.

7. Agaricus subfloccosus (LANGE). Fig. 20.

Synonymia: *Psalliota subfloccosa* LANGE, Fl. Ag. Dan. 4 : 58, t. 139 D, 1939.

Medium. Cap 6—8 cm., with a smooth, tomentose-fibrillose surface, disc slightly fawn-coloured, shading off to the almost whitish edge, near which are scattered some white, cottony scales (remnants of the outer veil). The ring is double, the thin interior ring being covered, close to the stem, by a narrow, but rather thick, radially split outer veil. The flesh is more reddish than in P. hortensis. Spores broadly oval or broadly ovate, 6,5 × 4 µ. Cystidia inflated clavate, about 10 µ broad. Basidia 4-spored. Rare. Found in great numbers in plantation of Picea (Hollufgaard, Fyn, 1915). Also on record from Sweden (Lundell). Diagnosis after Lange.

Of this species I got into my hand from Czechoslovakia only one receptacle figured in the adjoined photograph. This fungus agrees well with the description and figuring by LANGE, is very close to *Agaricus bisporus* LANGE, but has tetrasporic basidia.

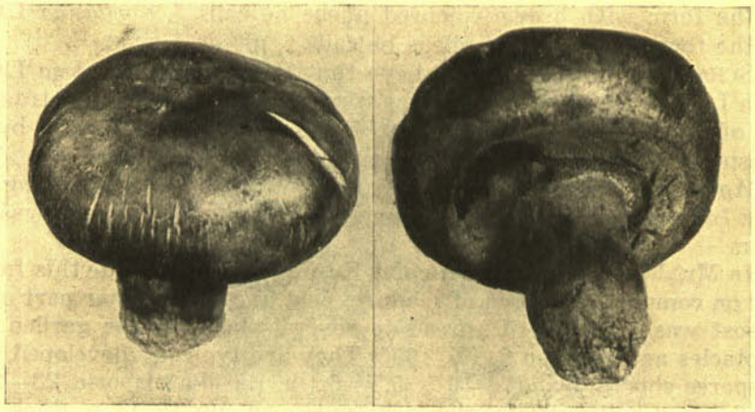

Photo A. Pilát.

Fig. 20. *Agaricus subfloccosus* LANGE.
Bohemia: prope Senohraby, ad terram cumulatam, 4. VI. 1950. ⅔ orig.

8. **Agaricus villaticus** BRONDEAU, em. RICH.-ROZE. (Tab. VIII.)

Synonymia:

Agaricus villaticus BROND. 1829?, FR. ?, QUÉL. p. p., RICHON-ROZE, BOUDIER, COOKE, Rea p. p., ROMAN SCHULZ p. p. HOTSON et STUNTZ, Mycologia 30 : 210, 1938. (non BRESADOLA, RICKEN, LANGE).
Agaricus campester B. *pratensis α vaporarius* VITTADINI, 1835, t. VII, teste SCHAEFFER et MOELLER.
Psalliota setigera RICKEN 1915 non PAULET.
Psalliota hortensis subsp. *subperonata* LANGE, Fl. Ag. Dan. t. 140 D, 1939.
Psalliota bivelata VELENOVSKÝ, České houby, p. 562, f. 88, 1921. — Novitates Mycol. p. 151, 1939. — Velenovskýi Species Nov. Basid. p. 216, 1948. — Icon in Mycologia, vol. IV, 1927 (DVOŘÁK pinxit), non PECK 1900.
? *Psalliota campestris* var. *umbrina* sensu BRESADOLA, Ic. Myc. t. 826, 1931.

Stately, compactly fleshy fungus, with a pileus up to 20 cm. in diameter, which is thickly and solidly, but also firmly fleshy, covered with fibrillose, coarse, dark brown squamules, decorated at the margin with broad and thick remnants of the velum.

Gills dirty red to chocolate brown, on the edge light gray, crowded and relatively narrow.

Stem very thick, sometimes up to 12 cm. long, cylindrical, otherwise short and thick, up to ventricose, up to 5,5 cm. thick, first white, but soon dirty from the flesh red coloration shining through, provided with a strikingly thick and tough ring, which generally lies close to the stem and is adhering, and at the lower, two-ledged margin it is 2—7 mm. thick, often torn, and not connected either with the tip of the stem or with its base. Below the ring are generally annular or zonal remnants of the velum universale, or the velum forms an ochrea at the base of the stem, or brown spots; more rarely it is torn into brown flakes or not developed at all.

Flesh white to dirty whitish, colouring when cut, especially in the upper part of the stem, flesh red to hazel rusty reddish. With

aniline it reacts to saturated red to brown. When fresh it smells like freshly felled pine wood, later more mouldily, and in age it has a most unpleasant smell. It tastes sweetish hazel.

Spores roundedly ovoid, 6,5—8 × 5—6 µ. Basidia 25—30 × 7—8 µ, tetrasporic. Cheilocystidia on the edge not striking, 8—10 µ thick.

This species growing outside the forest, most often on rubbish-heaps in towns, at the border of roads, more rarely also in gardens and on compost, is better known in Czechoslovakia under the name of *Psalliota bivelata* VELENOVSKÝ, as the latter in his "České houby" (1921) described and photographically figured it according to receptacles which Maximovič found in the park of Žehušice. In volume IV of the journal Mykologia (1927) a very good coloured plate painted by B. DVOŘÁK was published.

Under the name of *Psalliota bivelata* VELENOVSKÝ (1921) described well this interesting fungus and also the photographic figuring joined to the description does justice to the character and occurrence of the young receptacles. In 1926 LANGE re-described this species as *Psalliota hortensis* COOKE var. *subperonata* LANGE (Dansk. Bot. Arkiv 4 : No. 12, p. 8). His description is not of the best, and the connection of this fungus with *Psalliota hortensis* is extremely unhappy, as these two fungi have nothing in common. Besides LANGE remarks that *Psalliota Rodmani* PECK is probably conspecific — which is wrong, as this American species belongs as synonymum to *Agaricus edulis* (VITT.) VITTADINI'S figuring is 6 years younger than BRONDEAU'S name of 1829. Even though the description is rather unclear, the name is pertinent. RICHON-ROZE (1885—89), further BOUDIER and COOKE figured this species well under this name. Prior to VELENOVSKÝ PECK (1900) used the name of *Psalliota bivelata* for another American species of the genus *Agaricus*, which has subspherical spores, 4—5 × 3,5—4 µ.

HOTSON & STUNTZ (Mycologia 30:226, fig. 8, 1938) published a photograph of receptacles from the northwest coast of the USA. Their spores measure 8—10 × 5—6 µ, which is much larger than in the European fungus. A. H. SMITH believes — and I think rightly — that the fungus of HOTSON & STUNTZ belongs as a more squamose form to *Agaricus macrosporus* M. & S. (= *Ag. augustus* sensu SMITH). F. C. STEWART (Mycologia 21:41—43: Is Psalliota brunnescens under cultivation?) describes a fungus which is cultivated in America from spawn, sent out in 1929 by "The American Spawn Company", St. Paul, Minnesota. KAUFFMAN determined this fungus as presumably belonging to *Agaricus brunnescens* PECK. According to STEWART's description and figuring this fungus is conspecific with the European *Agaricus villaticus* BROND. (= *Psalliota vaporaria* VITT.). The true American *Agaricus brunnescens* PECK, very well figured in BURT: Icones Farlowianae t. 62, is a different species. It has spores 6—7(8) × 5—6 µ, pileus fibrous, sometimes slightly squamose, in youth slightly silver white, soon hazel brown to brown.

The oldest name under which this species is given is *Ag. villaticus* BROND., 1829. JUL. SCHAEFFER maintains however that it is badly founded

and unclear, and that therefore preference must be given to the name *Ag. campestris*. B. *pratensis* α *vaporarius* VITTADINI 1835, as VITTADINI described and figured it unambiguously under this name. J. SCHAEFFER dealt in detail with the synonymia of this species in the Annales Mycologici, 36: 73—75, 1938. I gave my opinion above.

Ag. villaticus BROND. is a very characteristic and easily recognizable species by its large (up to 20 cm. in diameter), compact, coarsely and dark brown squamose receptacles, which carry the ring adhering to the stem, and besides the stem is decorated with brown rings of the velum universale, which sometimes look like a second ring. Its flesh turns red when cut. The spores are subspherical, 6,5—8 × 5—6 µ. The detailed description is given in the cited paper by SCHAEFFER and agrees well with the specimens found in Czechoslovakia. A good figuring is to be found in the journal Mykologia (Prague) vol. IV, t. 5, 1927 (as *Psalliota bivelata* VEL.), further on SCHAEFFER's plate in MICHAEL-HENNIG-SCHAEFFER, Führer für Pilzfreunde t. 50, (Psalliota vaporaria [VITT.] M. & S.) VITTADINI, t. VIII, — COOKE Ill. of Brit. Fungi t. 585. — *(Ag. campester* var. *villaticus* BROND.) LANGE. Flora Agaricina Danica t. 140 *(Ps. subperonata* LANGE).

This species grows most abundantly in towns on rubbish-heaps. It was found several times in Prague. In 1926 Mr. ZITA brought to the Botanical Institute of the Charles University in Prague a number of beautifully developed receptacles of this species, which he had found at Prague-Libeň in one garden, on a heap of rubbish and refuse in May of that year. J. VELENOVSKÝ reported this find in the journal Mykologia 3: 106, 1926. On pages 96—97 two of my photographs of this fungus are reproduced.

In the herbarium of the National Museum (No. 500.131) are specimens from the collection of J. HERINK, found at Prague-Žižkov, 14-IX-1938. Spores 7—7,5 × 5,5 µ. M. DEYL collected beautiful receptacles at Nový Bydžov, 20. VI. 1943 (Spores 7—7,5 × 5,5 µ).

I found beautiful receptacles at Prague-Libeň, 1-XI-1933. R. MLYNAŘÍK found on 10-IX-1948 receptacles on the Václavské nám. in Prague, where they grew under the iron grating protecting the roots of the row of trees in the street. His photograph was published in the journal Čes. Mykologie 2: 122. Spores according to J. Charvát's measuring 6—7(8) × 5—6 µ.

MOELLER gives in his Danish Psalliota Species (Friesia 4: 42, 1950.) *Psalliota subperonata* LANGE as a distinct species. He affirm that P. subperonata is nearly allied to Agaricus villaticus Brond., but differs from it in the pinkish red of the flesh, the well developed cystidia (clavate, sometimes divided into cells, hyaline or brown, 32—60 × 9—13 µ, easily separable from the hymenium, edge sterile) on the edge and the less rounded form of the spores (roundish ovate, 5—7 × 4—5[5,5] µ). — These differencies are, I think, too small — to characterize a separate species.

U t i l i s a t i o n: *Ag. villaticus* BROND. is a fungus striking in its appearance, but because it is insignificant looking it does not lure to

Photo A. Pilát.

Fig. 21. *Agaricus Deylii* PILÁT.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. Dr. Miloš Deyl. 1/1 orig.

eating. The young receptacles are said to be edible, later they are, as J. SCHAEFFER writes, indigestible and cause even vomiting in more sensitive persons.

Sectio 2: *Sanguinolentae* J. SCHAEFFER.

9. **Agaricus Deylii** PILÁT sp. n. (Fig. 21—23.)

P i l e u s in youth globose-ovoid, then hemispherically arched, long enclosed by the velum, pure white and not changing colour, in youth

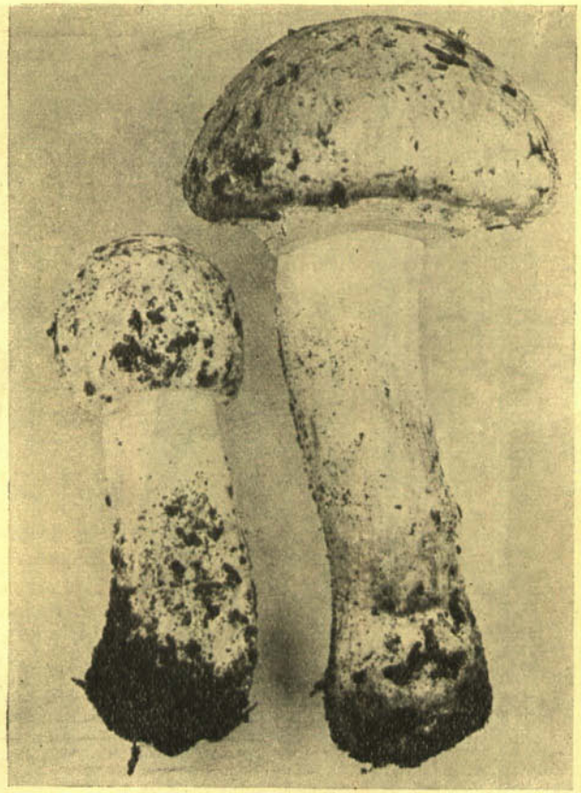

Photo A. Pilát.

Fig. 22. *Agaricus Deylii* PILÁT.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. Dr. Miloš Deyl. ¾ orig.

fairly moist to touch, non-squamose, yet by no means smooth, but covered on the surface with detached fibres which form irregular, fibrously squamose groups distinctly visible only under the magnifying glass and which when crushed colour slightly dirty, at the apex almost smooth, but not shiny, hemispherical still before the cracking of the velum, 6 cm. in diameter, later probably plane-arched and up to 10 cm. and more in diameter (I have seen only younger receptacles).

Gills rose with a flesh-coloured tinge, even when the pileus is in bud, and colouring rose at once in earliest youth, with a whitish edge.

Stem cylindrical, fairly thick, in young receptacles 6—10 cm. long and 2 cm., at the base up to 2,5 cm. thick, rather regularly cylindrical, only slightly thickened at the base or almost not thickened at all, ending more or less bluntly below, but not strikingly plane-

Photo A. Pilát.

Fig. 23. *Agaricus Deylii* PILÁT.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. Dr. Miloš Deyl. Specimina iuvenilia. 1/1 orig.

truncated, pure white, silky fibrous, almost glabrose, only below the ring with sparse, tiny, squamulosely detached fibres, at the base turning long after bruising slightly dirty rusty brown, inside from youth with a tubular hollow.

Ring of two layers (its lower layer dentate at the margin), connected with the tip of the stem, pure white, membranaceous and rather tough.

Flesh white, turning distinctly but little intensively red when cut, in a cross-section at the place of connection of the pileus and stem often rufescent with an orange or rhuharb tinge. Also wounded places on the surface of the stem turn gradually red. Flesh in the pileus white, when cut almost unchanging. Later the red colouring gradually vanishes and changes into a dirty rusty or rusty brown colour. Smell slight, not striking, not of anise, taste not pronounced.

Basidia tetrasporic, 8—10 × 20—30 µ. Cheilocystidia ovoid pyriform, abundant on the edge of the gills, 15—22 × 27—30 µ.

Spores rather long-ellipsoid, 9,5—11 × 5,3—6 µ.

Hab. In spruce forest on limestone substratum at Karlštejn near

Boubová, 20-IX-1950, 8 fairly young and young receptacles, leg. Dr. Miloš Deyl.

Macroscopically this fungus is very similar to *Ag. chionodermus* PILÁT, but the flesh is red. From among the group of *Sanguinolentae* the closest related is *Agaricus Beneši*, which has however a much longer stem and much smaller spores. Macroscopically our fungus is striking by its white colouring and by its white flesh turning gradually red, especially when cut, and by its relatively large spores, 9,5—11 × 5,3—6 µ.

Nearly allied is *Agaricus depauperatus* MOELLER, from Denmark, which is different with the alutaceous pileus with a faint flesh coloured tinge, especially on the disc, finally darker, with the gills greyish flesh-coloured and smaller spores- 7,5—8,5(10) × 4—5 µ. Cf. Moeller, Friesia 4:24, t. IIIa, IX, 1950. Nearly allied is also *Agaricus squamuliferus* MOELLER (Friesia 4:21, fig. 6, 1950), which is different with its pileus covered at first with numerous small squamules especially towards the edge.

10. **Agaricus Beneši** PILÁT. (Fig. 24.)

Synonymia:

Psalliota Beneši PILÁT, Mycologia 2 : 47—49, 1925. — SCHAEFFER et MÖLLER, Annales Mycologici, 36 : 80, 82, 1938. — A. H. SMITH, Papers of the Michigan Academy, 25 : 120—121, 1939 (1940).

Psalliota Bernardi RICKEN, Vademecum ed. I., p. 136, ed. II., p. 144. — BENEŠ, Časopis českých houbařů 4 : 120—122, fig. 44—46, 1923—1924. (non *Psalliota Bernardi* QUÉLET!).

? Psalliota bulbosa VELENOVSKÝ, Novitates Mycologicae, p. 153, 1939.

Agaricus albosanguineus HOBSON et STUNTZ, The Genus Agaricus in Western Washington, Mycologia 30 : 217, fig. 4, 1938. — A. H. SMITH Papers of the Michigan Academy 25 : 120—121, 1939 (1940).

P i l e u s pure white, fleshy, dry, in youth subglobose, then hemispheric-campanulate, finally archedly expanded, 6—15 cm. in diameter, not shiny, fairly early torn into medium large, adpressed squamules, but not cracked areolate. The squamules are white on a light white background.

G i l l s crowded, free, rather broad, in youth rose, then flesh-pink, later chocolate brown.

S t e m strikingly long, up to 16 cm., sometimes up to twice as long as the diameter of the pileus, cylindrical, almost equally thick in all its length, below slightly clavate to clavate-bulbously thickened, in youth solid, finally hollow and always more or less bent, in the lower half, but sometimes up to the ring finely floccose-squamose, above the ring and on the upper side or the ring finely fibrously furrowed (but this fibrous furrowing is so slight as to be almost imperceptible), bruised the stem tinges wine red to reddish brown, especially when cut in the upper part; in its lower part the stem almost does not redden at all, nor does the flesh of the pileus. Ring big, of two layers, in the lower part torn dentate and crustily floccose.

F l e s h tough, pure white, after bruising especially in the upper part of the stem turning intensively blood red, later brunnescent. Smell on the whole not pronounced, not of anise.

Photo A. Pilát.

Fig. 24. *Agaricus Beneši* PILÁT.
Bohemia: Karlštejn, prope "Královská studánka", solo calcareo, 1. X. 1950, leg. Zdeněk Pouzar. ⅔ orig., fungus invenilis ¾ orig.

S p o r e s ovoid ellipsoid, 5—5,5 × 3,5—4,5 µ (or 6—7,2 × 3,5—4 µ), brown, smooth, with one large drop of oil in the plasmatic contents. Basidia clavate, hyaline, 18—25 × 6—8 µ, with four sterigmata 2 µ long. Cheilocystidia on the edges of the gills pyriform clavate, 25—30 × 10—15 µ.

Hab. On the border of deciduous forest *(Quercus robur, Acer campestris, Ulmus effusa, Cornus sanguinea, Ligustrum vulgare, Prunus spinosa* etc.) in one place below the forester's house at Jizbice. Jizbice near Nymburk, all through October to the middle of November, rare. Edible according to R. Beneš.

This interesting species which R. Beneš discovered in Bohemia at Jizbice near Nymburk he determined correctly as Psalliota Bernardi in the sense of Ricken. He described his find in his article "Záhadná pečárka — Psalliota Bernardi Quél.-Ricken?" (Časopis československých

houbařů 4: 120—122, 1923—1924). Three figures are given in the article, namely one good photograph and two pen-and-ink drawings.

The following year he sent me newly found receptacles for revision. They were just as he had found them in the preceding year and as he had described them in the article cited. I found that Quélet's original *Psalliota Bernardi* cannot be conspecific with Ricken's, but that we have here two quite different fungi, which do not even resemble each other nor are more closely related. Therefore I designated *Psalliota Bernardi* RICKEN as *Psalliota Beneši* PILÁT and described this new species in my article "Psalliota Bernardi Quél. a Psalliota Beneši sp. n." in the journal Mykologia, 2: 47—49, 1925. At that time I also photographed the receptacles sent to me by R. Beneš, but by misfortune the negative was broken before I could make a copy of it. The receptacles agreed, however, accurately with those which Beneš figured in his original paper.

Though since 1925, i. e. for full 25 years, I have been looking for this interesting fungus, I have not been able to find it again in Bohemia. Thus it must be extremely rare. I have only heard that it was found above the village of Solopisky in Central Bohemia. I have not seen the receptacles, so I am unable to confirm whether it really was my species.

Only this year (1950) I saw for the first time receptacles of this species in the field. On October 1st, 1950, on an excursion of the Czechoslovak Mycological Club to Karlštejn in which I took part, Mr. Zd. Pouzar found near "Královská studánka" almost on the limit of the tall spruce forest and the deciduous wood in the undergrowth of bushes and herbs in a shady place on a limestone substratum one adult and three young receptacles of this species. All the receptacles agreed well with the type. Only the spores I found in the fungus of Karlštejn slightly larger, namely 6—7,2 × 3,5—4 μ.

The most closely related species I know is *Agaricus Caroli* PILÁT, which has the same spores, but differs considerably macroscopically as its receptacles are much larger and fleshier, the stem relatively short and thick. It has on its pileus much larger, more distinct, light grayish brown squamules on a white background, and a slightly more rufescent flesh.

Agaricus Beneši PILÁT is a very characteristic fungus, striking especially by its white colouring, the strikingly long stem, and the rufescence of the flesh, especially in the upper part of the stem.

J. SCHAEFFER mentions this species in his paper "Beitrag zur Psalliota-Forschung" Annales Mycologici 36: 80, 82, 1938. The receptacles were sent to him from the Wiener Wald in Austria by SPRONGL. He writes that he and F. MÖLLER found a slightly different form in Lolland in Denmark. In the survey of the chemical reactions he places this species in the neighbourhood of Agaricus campester as it reacts similarly.

ALEXANDER H. SMITH in his publication "Studies in the Genus Agaricus", Papers of the Michigan Acad., 25: 120—121, 1939 (1940), published an English translation of the original Latin diagnosis, which was published in 1925 in the journal Mykologia l. c., and writes that the American species *Agaricus albosanguineus* described by HOTSON J. W. and STUNTZ D. E. in their article "The Genus Agaricus in Western

Washington", Mycologia 30: 217, fig. 4, 1938, is conspecific with this European species. *Agaricus albosanguineus* HOTS. et STUNTZ was found under *Pseudotsuga Douglasii* in the forests at Seattle, Washington. It has spores 5,5—6,5 × 4—5 μ. Description and figuring agree well with *Agaricus Beneši* PILÁT. Its diagnosis differs only in the description of the ring, which is said to be simple in the American species — in *Agaricus Benešii* it is distinctly double. The description and figuring of HOTSON and STUNTZ refer evidently to adult receptacles, which have an already more or less flaccid ring, they seem not to have seen any young receptacles so that the discrepancy between the two descriptions is easily explained. Otherwise the American fungus has also a strikingly long stipe, a white, slightly squamose pileus, rufescence of the flesh and the other characters quite analogous to the European fungus so that to me just as to A. A. SMITH the conspecifity of the two species seems indubitable.

11. **Agaricus Caroli** PILÁT sp. n. (Fig. 25—28. Tab. I, IX, X.)

Pileus 6—16 cm. in diameter, at first a little broadly glandiformly arched, then more hemispherical with truncated apex, and finally flatly expanded and in old age sometimes also a little depressed at the apex, covered with a thin cuticle, which in maturity is coloured very light whitish grayish to brown and not cracked only at the apex,

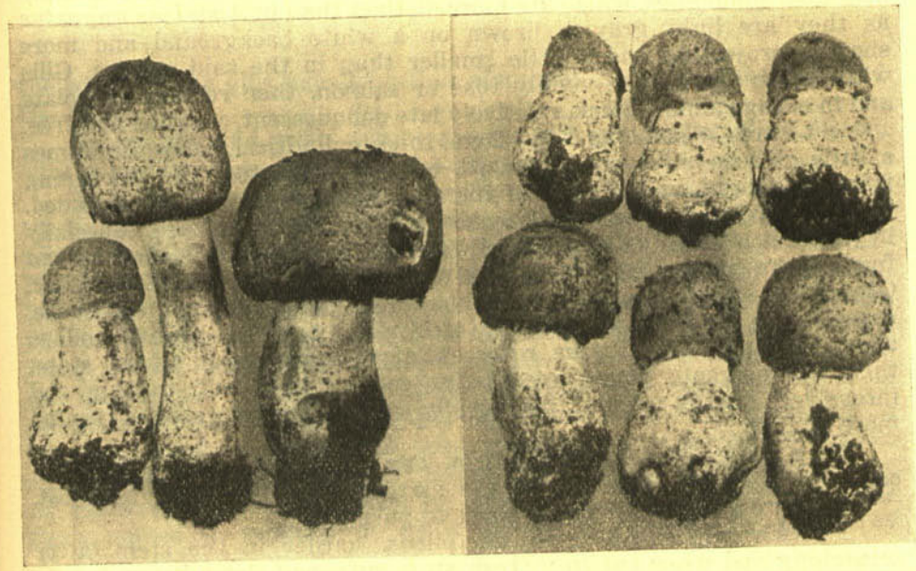

Photo A. Pilát.

Fig. 25. *Agaricus Caroli* PILÁT.
Bohemia: Karlštejn, in Picetis solo calcareo prope "Královská studánka", 9. VIII. 1950. Specimina iuvenilia. ½ orig.

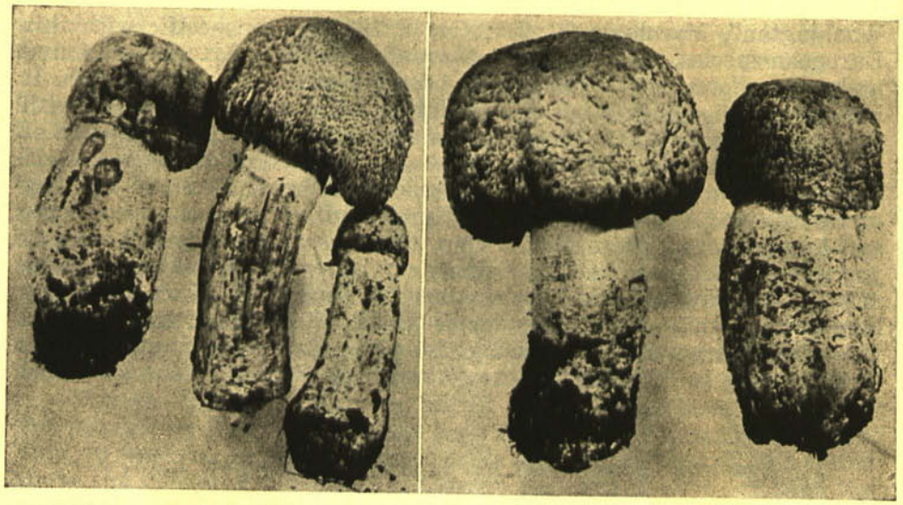

Fig. 26. *Agaricus Caroli* PILÁT. Photo A. Pilát.
Bohemia: Karlštejn, in Picetis solo calcareo prope "Královská studánka". 9. VIII. 1950. ½ orig.

otherwise cracking already in youth into fairly regular and sharply delimited squamules, which are more distinct than in *Agaricus augustus* as they are light grayish brown on a white background and more sharply projecting and a little smaller than in the said species. Gills whitish, but very soon vividly rose or salmon, then reddish chocolate and in old age almost black, relatively late deliquescent, crowded and free.

S t e m 6—9 cm. long, 1½—2 cm. thick, cylindrical, below sometimes a little globose-bulbously thickened, but not truncated. The thickening is usually slight, and the end of the stem below is clavate and rounded. It is relatively short and thick, entirely white. Near the base, especially in youth, it is usually decorated with several irregular rows of white and fairly large squamules, which form almost circles one above the other. Otherwise it is in maturity fibrous to slightly sinuated squamose, especially in the lower half, white, thickly fleshy and but slightly hollow, above the ring finely fibrous, rufescent after scratching in a fresh state, then brunnescent; young receptacles colour, when cut, quickly and intensively orange salmon, then vividly salmon. Dry receptacles reacted more slightly.

R i n g membranaceous and firm, long persistent, double, collar-like, on the underside, especially at the margin, slightly radially cracked.

S p o r e e sooty brownish black to purple.

F l e s h white, softer in the pileus, harder in the stem, after scratching and when cut in a fresh state rufescent, later brunnescent; smell slight and not pronounced, fairly pleasant of apple. Taste not pronounced, similar to that of most mushrooms. Good edible fungus.

B a s i d i a tetrasporic, 7—8,5 × 25 µ. C h e i l o c y s t i d i a on

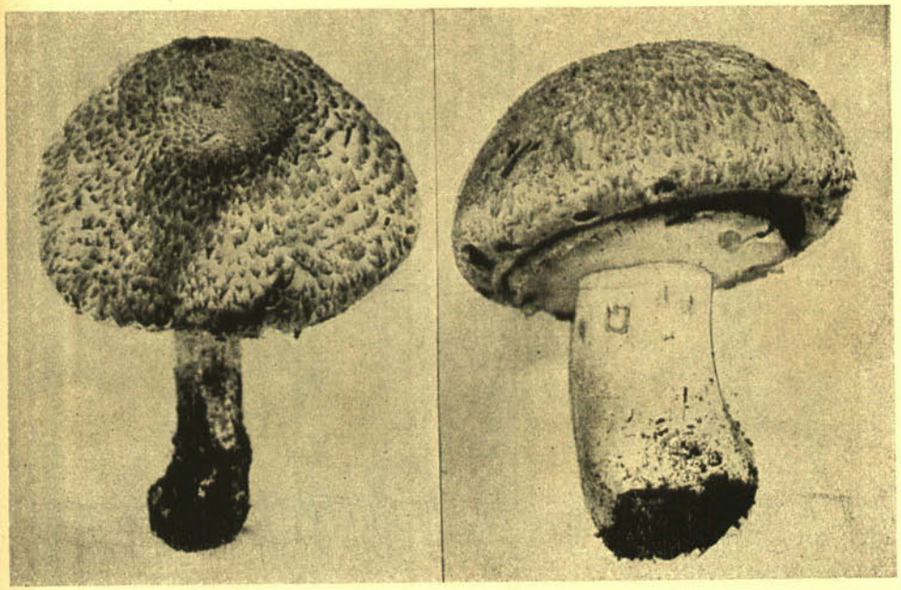

Photo A. Pilát.
Fig. 27. *Agaricus Caroli* PILÁT.
Bohemia: Karlštejn, in Picetis solo calcareo prope "Královská studánka", 13. IX. 1946 et 9. VIII. 1950. Specimina semiadulta, ½ orig.

the edges of the gills usually rather abundant, baggy clavate, 8—13 × 20—27 µ.

Spores ellipsoid, with oblique apicule and one droplet of oil, brown with a reddish tinge, 6—7,5 × 4—4,8 µ.

Hab. In full-grown spruce forest at Karlštejn near, "Královská studánka" I have collected this species regularly every year from August till the end of September: 13-IX-1946, 20-IX-1946, 19-IX-1947, 26-IX-1948, 18-IX-1949, 3-VIII-1950, 9-VIII-1950, 12-VIII-1950, 20-VIII-1950, 1-X-1950. It grows only in one place, which measures about 100 square meters. Though I looked for this species also in the surrounding spruce forest I have never found it anywhere else. The place where it occurs is a tall spruce forest, fairly damp, on very pure limestone. The receptacles have always all the same aspect and do not change at all. In the neighbourhood grow also other mushrooms, *Agaricus arvensis, A. augustus, A. silvaticus, A. haemorrhoidarius, A. xanthodermus, A. semotus, A. chionodermus, A. Beneši* etc. The rufescence of the flesh makes it reminiscent of A. silvaticus Schaeff. or rather of *A. haemorrhoidarius* SCHULZER, but already from afar at the first glance it can be distinguished by the white coloration, the sharp squamosity and the unusual fleshiness, the short and white stem. It has slightly smaller spores than *A. haemorrhoidarius* SCHULZER. By its

Photo A. Pilát.

Fig. 28. *Agaricus Caroli* PILÁT.
Bohemia: Karlštejn, in Picetis solo calcareo prope "Královská studánka", 20. VIII. 1950 et 13. XI.1946. Specimina adulta, ½ orig.

squamosity it is reminiscent of *A. augustus*, but the character of the squamules is different. The most closely related species is *Agaricus Beneši* PILÁT, which differs by its long stem, minutely and white squamose pileus and less rufescent flesh.

Nearly allied to Ag. Caroli Pilát is *Agaricus squamuliferus* MOELLER (Friesia 4:21, fig. 6, 1950), which is different with its pileus covered at first with numerous small squamules especially towards the edge.

Of the American species our species is the most reminiscent of *Ag. Pattersonae* PECK (Bull. Torr. Bot. Cl. 34:347, 1907). A. H. SMITH published an excellent photograph in his article "The genus Agaricus", in Papers Michigan Academy, 25:107—138, on pl. X, 1940. According to A. H. SMITH this American species has spores of 6—7 × 4—4,5 µ (according to Peck 8—9 × 5—6 µ), i. e. the same size as our species. Its description as given in Saccardo's Sylloge Fungorum, 21:204, 1912, differs in details. Especially its flesh does not turn red, and the gills are not rose, the pileus is only sometimes cracked squamosely, and the stem is bulbously thickened at the base. It was found on the soil under *Pinus* and *Cupressus* at Stanford University in California. From the description and photograph I judge that it belongs rather to the affinity of *Ag. campester*.

Photo A. Pilát.

Fig. 29. *Agaricus silvaticus* SCHAEFFER.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, ⅔ orig. Leg. A. Pilát.

12. **Agaricus silvaticus** SCHAEFF. sensu RICKEN, non BRESADOLA. (Fig. 29—33.)

Psalliota sanguinaria KARSTEN sensu LANGE, t. 137 B. — *Psalliota haemorrhoidaria* sensu BRESADOLA, l. c. Myc. t. 831 (non SCHAEFFER), sensu KAUFFMAN et A. H. SMITH, HOTSON & STUNTZ.

This species is very widely distributed in Bohemia. It is specially abundant in spruce forests on a limestone substratum, especially around Karlštejn and Roblín in Central Bohemia on Devonian limestones, and its grows here together with *Agaricus haemorrhoidarius* SCHULZER, which is however much rarer. Though it is a common fungus in these spruce forests, occurring almost in masses, and though the spruce forests constitute on the whole only small enclaves in the deciduous forests there, yet I have seen it but rarely and mostly not in its typical form in the surrounding deciduous forests around Karlštejn.

As macroscopically it is hardly possible to distinguish some forms of *Agaricus haemorrhoidarius* SCHULZER from larger receptacles of *Agaricus silvaticus* SCHAEFF., I studied *Agaricus silvaticus* systematically to see whether the size of its spores varies and whether these two species do not pass into each other. In August 1950, when it occurred in these forests in masses, I collected on several excursions

Photo A. Pilát.

Fig. 30. *Agaricus silvaticus* f. *fagetorum* PILÁT.
Bohemia: Stříbrná Skalice, in Fagetis montis "Studený vrch", 13. VIII. 1950, leg. Zdeněk Pouzar. ⅔ orig.

all receptacles I could find and studied them all under the microscope. Thus I examined receptacles from at least 30 different places. I found no transitions in my material between the spores of *Agaricus haemorrhoidarius* SCHULZER and of *Ag. silvaticus* SCHAEFF. Both species are tetrasporic and have spores of constant size. *Agaricus silvaticus* SCHAEFF. has spores of 6—6,3(6,5) × 3,5—4(4,3) µ, whereas *Agaricus haemorrhoidarius* SCHULZER has considerably larger spores, 7,5—10 × 4,5—5,5 µ. I did not find any transitions between these two sizes.

In deciduous forests *Agaricus silvaticus* occurs in Bohemia only very rarely. Mr. ZD. POUZAR found on 12-VIII-1950 at Stříbrná Skalice on the "Studený vrch" in a beech wood in one specimen a form with a pileus with coarse, adpressed, subcottony, pallid rusty to almost skin rusty squamules on a whitish background. The receptacle was completely full-grown and after scratching reacted to the air by turning only slightly red, colouring rather only brown. It had the stem white, shinily-silkily fibrose, smooth, with an indistinctly double, membranaceous ring. The gills of the adult fungus were reddish-violet black. I designate this coarsely squamose form in beech woods as f. f a g e t o r u m PILÁT. It is interesting that SMITH (Pap. Mich. Acad. 25: 124, 1944, t. VIII) published under the name of *Agaricus haemorrhoidarius* the photograph of a fungus with small spores, which has a coarsely squamose pileus on the whole like our f. *fagetorum*. (Fig. 30.)

Agaricus silvaticus sensu BRESADOLA, Icon. Mycol. t. 830, represents *Agaricus meleagris*. On the contrary *Agaricus haemorrhoidarius* BRESADOLA, Ic. Mycol. t. 831, is only a typical *Agaricus silvaticus* SCHAEFF.

Photo A. Pilát.

Fig. 31. *Agaricus silvaticus* var. *pallens* PILÁT.
Bohemia: Karlštejn-Boubová, in silva frondosa solo calcareo, 15. IX. 1950, 1/1 orig. Leg. A. Pilát.

It is difficult to say in each case whether *Agaricus silvaticus* of American authors is identical with the European fungus of this name in the sense as it is defined e. g. by RICKEN, LANGE, VELENOVSKÝ, J. SCHAEFFER or PILÁT and others. The young receptacles of the European *Agaricus silvaticus* (with small spores) turn red quickly and strikingly after scratching in the pileus as well as in the stem. Dry and old specimens of course turn red slowly or do not react at all. The European *Agaricus silvaticus* SCHAEFFER is conspecific with *Agaricus haemorrhoidarius* in the sense of American authors — of European authors only BRESADOLA gives *silvaticus* as *haemorrhoidarius* SCHULZER (Bresadola's *A. silvaticus* is *Ag. meleagris* J. Schaeffer, which is probably the American *Ag. placomyces* PECK).

HOTSON & STUNTZ describe from western North America as *Aga-*

Photo A. Pilát.

Fig. 32. *Agaricus silvaticus* var. *pallens* PILÁT.
Bohemia: Karlštejn-Boubová, in silva frondosa solo calcareo, 15. IX. 1950, 1/1 orig. Leg. A. Pilát.

ricus silvaticus a fungus which has the pileus 8—10 cm. in diameter, with the squamules and apex reddish brown or brown, flesh white, almost not reacting by turning red. Stem 8—10 × 1—1,5 cm., white, with a bulbose base often coloured yellow. Spores 6—8 × 3—4 µ. All these characters show that the *Agaricus silvaticus* of HOTSON and STUNTZ is conspecific with the European species *Agaricus lanipes* MOELLER et J. SCHAEFFER. It is interesting that the fungus which MOELLER and J. SCHAEFFER described as *Psalliota lanipes* and which grows abundantly in deciduous and coniferous woods around Berlin, and which was long regarded as *Ag. silvaticus*, has not yet been found in Bohemia, though I myself and other Czech mycologists have long looked for it. All specimens found up till now in Bohemia (with small spores and rufescent flesh and brownish rusty squamose pileus) belong to the typical *Agaricus silvaticus* SCHAEFFER.

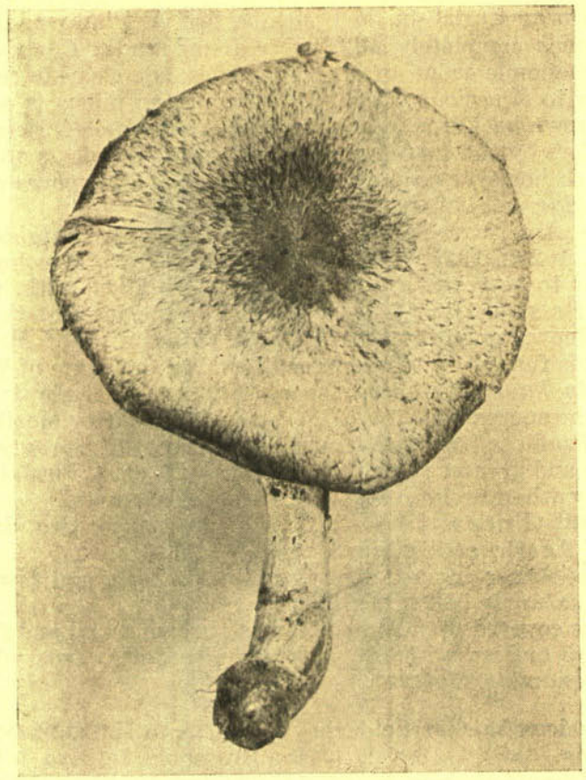

Photo A. Pilát.

Fig. 33. *Agaricus silvaticus* var. *pallens* PILÁT.
Bohemia: Karlštejn-Boubová, in silva frondosa solo calcareo, 15. IX. 1950, leg. A. Pilát. ¾ orig.

Var. **pallens** var. n. (an sp. n. ?). Fig. 31—33.

Pileus 6—7 cm. in diameter, arched as in the type, but more crowdedly and more distinctly reddish brown fibrosely squamose on a lighter, pale grayish reddish brown background, only at the apex almost smooth, brownish, red. Ring white, upper, of one layer, soon flaccid because it is thin, white. Stem below the ring smooth, only very finely fibrose, with not numerous, detached fibres, above the ring silkily fibrose and shiny, 8—8,5 × 1—1,2 cm., not thickened at the base, slightly bent, when wounded colouring quickly and intensively reddish rusty (not so characteristically red as the type), at the tip of the stem more rufescent, then turning grayish, in old age even gray; spores larger than in the type, 6—8,5 × 4—5 µ, ellipsoid, slightly amygdaloid. Cheilocystida globose-clavate, 10—18 µ thick.

In deciduous wood *(Carpinus betulus, Tilia cordata, Quercus robur)*

at Boubová near Karlštejn, in Bohemia, leg. A. Pilátová, 15. IX. 1950. Two specimens completely alike were found under *Carpinus betulus*.

The taxonomic value of this fungus is not clear to me. It forms a transition to *Agaricus Annae* PILÁT, but the pileus is squamose on a reddish brown background and the spores are smaller. From *Ag. silvaticus* it differs by the slightly lighter colour of the pileus and the larger spores, which however do not attain the size of the spores of *Agaricus haemorrhoidarius* SCHULZER.

Of the American species *Agaricus subrufescentoides* MURRILL (Mycologia, 4: 299, 1912, cf. also HOTSON & STUNTZ, Mycologia, 30: 212, 1938) seems to be related to, perhaps even identical with, var. *pallens* PILÁT, but its spores are 6—7 × 3,5 µ. For the present the American species is known only from the original description of MURRILL, who described this fungus from specimens found in the State of Washington.

Psalliota haemorrhoidaria sensu MOELLER (Friesia 4: 33, t. XIV, 1950) had the spores 4,5—6(8,5) × 3—3,5(4) µ. After Moeller is differing from Psalliota silvatica sensu Moeller with the greater pileus (8—12 cm.) and greater stem (8—12 × 1,5—2,5 cm.). Flesh immediately crimson rosy when broken. Deciduous woods, pastures.

MOELLER (Friesia 4: 38—39, 1950) described two darker scaly varieties of Agaricus silvaticus:

1. Pileus obtuso-convex, densely redbrown scaly and fibrillose. Stem white: var. *saturata* MOELLER.

2. Pileus covered with sparse blackish brown scales and fibrils. Stem covered more or less with brown squamules downwards when young: var. *fulvo-squamata* MOELLER.

13. **Agaricus haemorrhoidarius** SCHULZER in KALCHBRENNER, Ic. sel. Hymen. Hung., 1873, t. 18, f. l. — Non Bresadola, Ic. Myc. t. 831 (= Ag. silvaticus Schaeffer) non *Psalliota haemorrhoidaria* MOELLER 1950 (= Ag. silvaticus Schaeff.). *Psaliiota Langei* MOELLER, Friesia 4: 28, t. XI, 1950. (Fig. 34—36, Tab. XI.)

This species as I know it from Central Bohemia, where it grows fairly abundantly in spruce forests on a limestone substratum, f. inst. around Karlštejn and Roblín, corresponds accurately to the description and figuring of SCHAEFFER in MICHAEL-HENNING-SCHAEFFER "Führer für Pilzfreunde", t. 51. In the typical form it is a stately fungus, almost as big as a smaller *Ag. augustus*, with the pileus 8—15 cm. in diameter, hemispherical, then arched and finally almost expanded, fleshy, at the margin in youth broadly and thickly revolute, often a little lobate, at the apex often uneven, dark reddish brown, cracking towards the margin into broad, imbricate, well recognisable squamules on a light background, which towards the margin become more fibrose, smaller and arranged more closely.

S t e m 10—12 × 2,5 cm., cylindrical and generally slightly bent, not or only insignificantly thickened at the base, impure white, then grayish rose, after bruising brownish rusty, silkily shinily fibrose, smooth and non-squamose, with a rather large, membranaceous and broad ring which is floccose-squamose on the underside.

Photo A. Pilát.

Fig. 34. *Agaricus haemorrhoidarius* SCHULZER.
Bohemia: Solopisky, in silva mixta sub Picea excelsa, solo calcareo, 11. IX. 1950, leg. Zdeněk Pouzar. 5/4 orig. Specimen iuvenile.

G i l l s in youth grayish rose, then vividly rose, finally flesh brownish to black, crowded, free, then distant.

Basidia tetrasporic, sporee blackish violet.

S p o r e s ellipsoid to slightly amygdaloid, with obliquely sitting apicule, 8,5—10 × 4,5—5,5 µ, with one or several fat bodies.

Cheilocystidia on the edge of the gills abundant, clavate-cylindrical, 25—35 × 13—20 µ.

F l e s h whitish, when cut or scratched turning blood red.

The description was compiled from specimens which grew at the base of a stately spruce (Picea excelsa) in a mixed wood on limestone substratum, collected on 4-VI-1950 by O. HANČL at Solopysky, and from specimens found in the same spot by Z. POUZAR and me, 4-VIII-1950. In the same place Mrs. M. CHARVÁTOVÁ found nice receptacles on 4-VI-1950, spores according to the measurings of J. CHARVÁT 7—9 × 4,5—5 µ,

Photo A. Pilát

Fig. 35. *Agaricus haemorrhoidarius* SCHULZER.
Bohemia: Lovčice, in Picetis, 21. IX. 1950, leg. Dr. M. Deyl. ½ orig.
Specimina semiadulta.

and in the same spot 18-VI-1950 again by Mrs. M. CHARVÁTOVÁ (spores according to CHARVÁT 7—8 × 5—5,5 µ). I have found similar receptacles also sporadically in the spruce forests on a limestone substratum around Karlštejn. Dr. DEYL brought me very beautiful receptacles from Žiželice, where they grow in mass in spruce forest, 28-IX-1950.

In addition to this stately form there grows in the woods of Karlštejn also a smaller form, which has similar spores: 7,5—10 × 5—5,5 µ. It is usually not possible to distinguish this form macroscopically from the typical, small-spored *Agaricus silvaticus*. Also this smaller form of *Agaricus haemorrhoidarius* is normally larger than *Ag. silvaticus*, but does not differ in size from stately receptacles of *Ag. silvaticus*. Also the squamosity of the pileus and its coloration are not different from those of *Ag. silvaticus*. With certainty it can be distinguished o n l y microscopically by its much larger spores. I de-

Photo A. Pilát.

Fig. 36. *Agaricus haemorrhoidarius* SCHULZER.
Bohemia: Lovčice, in Picetis, 21. IX. 1950, leg. Dr. M. Deyl. ⅔ orig.
Specimen adultum.

signate this form, which is also tetrasporic, by the name of *Agaricus haemorrhoidarius* var. *silvaticoides* var. n.

Agaricus haemorrhoidarius SCHULZER as figured by KALCHBRENNER in his work "Icones Selectae Hymenomycetum Hungariae", 1873, t. 18, f. 1, according to the receptacles collected by SCHULZER on rotting roots of oak in the forest Nyarad near Mohacs in Hungary, is a stately fungus with strongly rufescent flesh and with a lobate pileus revolute in youth, dark reddish rusty-coppery, and with a stately whitish ring. The smaller specimen figured on the plate cited rather differs from the larger one by the shape of the squamules; by their shape and by the shape of the whole receptacle it is fairly reminiscent of *Agaricus lanipes* MOELL. et SCHAEFF. — except for the yellow colouring at the base of the stem, which it does not have.

Probably conspecific with this form of deciduous woods with a broadly squamose pileus is *Agaricus haemorrhoidarius* as figured by LANGE. According to MOELLER (Ann. Mycol. 36 : 68, 1948) it has spores of 7—9 × 3,5—5 µ, therefore rather narrow. According to LANGE it has spores of 8—9 × 4,5—5 or 7—8 (9) × 4,2—4,5 µ. From the form of spruce forests on a limestone substratum it differs by the broader squamulae on the pileus.

Agaricus haemorrhoidarius of American authors is not conspecific with the European fungus. The American fungus is small-spored and according to KAUFFMAN (Agaricaceae of Michigan, p. 243) it has spores of 6—7 × 4 µ, i. e. as large as *Ag. silvaticus*. A. H. SMITH (The Genus Agaricus, Papers Michigan Acad., 25 : 124, 1940) and HOTSON & STUNTZ (Mycologia 30 : 219, 1938) is of the same opinion. This small-spored American species is said to differ from *Ag. silvaticus* by its flesh being more red when broken. As in this respect I did not find any more distinct difference between the European specimens of *Ag. silvaticus* and *Ag. haemorrhoidarius* of American authors, I believe that the American *Ag. haemorrhoidarius* is only a form of *Ag. silvaticus*. The rufescence of the flesh in *Ag. silvaticus* is unequal. Fresh and juicy receptacles react much more than older and dryer ones. The receptacles figured by A. H. SMITH in his beautiful photograph (l. c. t. VIII) as *haemorrhoidarius* resemble completely our more squamose forms of *Ag. silvaticus*.

Agaricus haemorrhoidarius sensu BRESADOLA, Ic. Myc. t. 831 is a typical *Agaricus silvaticus* SCHAEFFER.

Of the American species *Agaricus californicus* PECK (cf. A. H. SMITH, Pap. Michig. Acad. 25 : 131, 1939) is perhaps conspecific with the European macrosporic *Agaricus haemorrhoidarius* SCHULZER. It has spores of 7—9 (10) × 4—5 (6) µ.

The figuring of *Agaricus haemorrhoidarius* in KONRAD & MAUBLANC, Ic. sel. fung. t. 28, is not particularly good. All receptacles figured have a strikingly thick and short stem, and the colour hue of the pileus does not correspond at all to the fungus I know. Also the size of the spores does not agree (6—7,5 × 3.5—4,5 µ). Of the pileus the authors cited say that it is pale yellowish brown, covered with brown or brown-tawnily ochraceous, fibrillose squamules which are more crowded in the middle and sparser towards the margin of the pileus. The size of the spores indicates that it is rather a variety or some closely related species from the affinity of *Agaricus silvaticus* and not an *Agaricus haemorrhoidarius* in the sense of Lange, Jul. Schaeffer and Pilát, as this fungus has spores of 7,5—10 × 5—5,5 µ.

Closer to the fungus of Konrad & Maublanc is perhaps the American *Agaricus halophilus* PECK sensu HOTSON & STUNTZ, Mycologia 30 : 219, 1939, which has spores of 7 × 4,4—5 µ, a strikingly short and thick stem, and broad squamules on the pileus.

Photo A. Pilát.

Fig. 37. *Agaricus Annae* PILÁT.
Bohemia: Karlštejn, in Picetis solo calcareo, 3. VIII. 1950, leg. A. Pilát.
¾ orig. Specimina semiadulta.

14. **Agaricus Annae** PILÁT sp. n. (Fig. 37—40, Tab. II.)

P i l e u s 7—9 cm. in diameter, in the adolescent stage broadly conical-campanulate, then fairly plane, but almost always with a low, fleshy umbo, on the apex light ochraceous brownish, the rest whitish, cracked into adpressed, distinct, pale ochraceous brown or reddish squamules sitting on an almost white, silky background, with a cuticle which when fresh almost does not redden after scratching.

S t e m tall and long, longer than in Ag. silvaticus, 10—16 × 1—1,5 cm., cylindrical, little bent, smooth, almost glabrose, only slightly fibrillose, only below slightly floccose-squamose, dirty white, when bruised turning slightly dingy red, then brunnescent, but mostly less so than in Ag. silvaticus, all through of equal thickness or only in the lower third slightly thickened, deeply rooted in the soil.

Photo A. Pilát.

Fig. 38. *Agaricus Annae* PILÁT.
Bohemia: Karlštejn, in Picetis solo calcareo, 3. VIII. 1950, leg. A. Pilát.
¾ orig. Specimina semiadulta.

Gills crowded, free, flesh pink with a violet tinge, then chocolate, in maturity remote from the stem, with heteromorphous edge, with baggily pyriform, thin-walled, hyaline cheilocystida, 25—35 × 10—14 µ.

Basidia tetrasporic.

Spores still a little larger than in Ag. haemorrhoidarius, ellipsoid, with oblique apicule, 9—11 × 5—5,5 (6) µ.

Flesh white or dirty white, rufescent in the air, but slighter than even Ag. silvaticus.

Hab. in spruce forest on a limestone substratum above "Vodopády" at Karlštejn 3 specimens, and at "Královská Studánka" (2 specimens) 3. VIII 1950.

On 15. IX. 1950 I found again unfar Karlštejn in the spruce forest at Boubová 7 mature receptacles of this species, unfortunately no young ones. Their pileus measured 7—10 cm in diameter, in old age it was much lighter than in *Agaricus silvaticus*, at the apex dirty ochraceous,

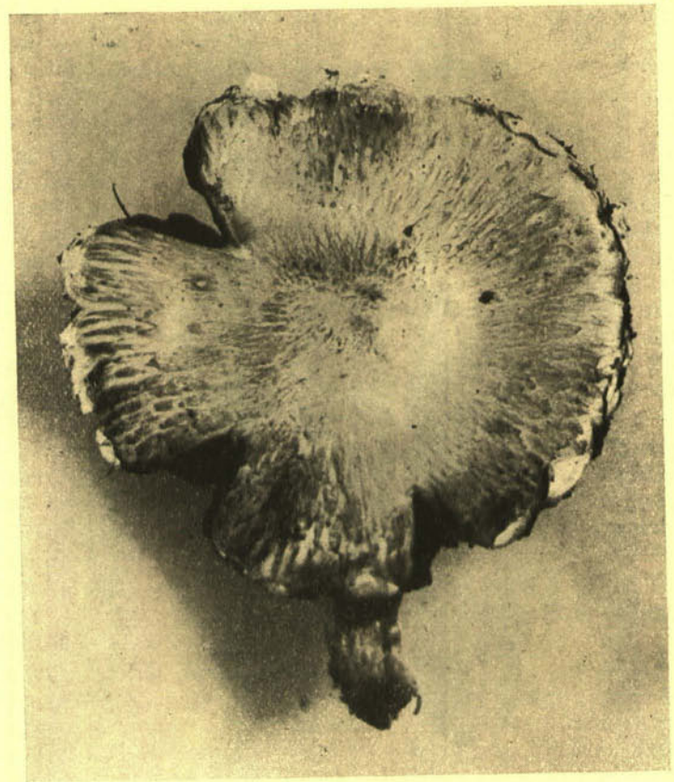

Photo A. Pilát.

Fig. 39. *Agaricus Annae* PILÁT.
Bohemia: Karlštejn, in Picetis prope Boubová, solo calcareo, 15. IX. 1950,
leg. A. Pilát. ¾ orig. Specimen adultum.

the rest light ochraceous brown, brownish squamose on a white background, without red or rusty colouring even on quite old receptacles. Flesh not reddening in old age, dirty whitish gray. Stem 9 × 1,2—1,8 cm., at the base up to 2,5 cm., cylindrical, downwards slightly clavate-thickened, but without a bulb at the base. Cheilocystida globose pyriform, up to 28 µ thick. Spores 7,8—9,3 (10) × 5,5—6 µ, dark brown. Basidia tetrasporic.

This interesting fungus belongs to the affinity of *Agaricus haemorrhoidarius* SCHULZER. It is striking at first glance by the light coloration of the pileus and by its sharp and fine squamosity. The squamules are much lighter than in *Agaricus haemorrhoidarius* and sit on an almost white background. Even in old age the pileus is not coloured reddish or rusty. The spores are of the same size or rather still larger. Fungus on the whole easily recognisable by the characters given.

Photo A. Pilát.

Fig. 40. *Agaricus Annae* PILÁT.
Bohemia: Karlštejn, in Picetis prope Boubová, solo calcareo, 15. IX. 1950, leg. A. Pilát. ¾ orig. Specimen adultum.

Sectio 3: *Flaventes* J. SCHAEFFER.

15. Agaricus augustus FR. (Tab. XII.)

Synonymia: *Psalliota perrara* SCHULZER, 1879, — BRESADOLA, Ic. Myc. t. 832 — *Ag Bresadolae* SCHULZER, 1885.

One of the most beautiful and largest of our species, fairly widely distributed in Bohemia, especially in spruce forests, and specially abundant in the spruce forests on limestone substratum around Karlštej and Roblín unfar Prague.

P i l e u s ellipsoid-globose, then hemispherical and expanded, 10—20 cm. in diameter, often with a distinct umbo which is dark ochraceous brown, otherwise the whole pileus breaks up into regular, imbricate, adpressed, fibrillose, yellowish brown, vividly brown ochraceous to brownish red squamules, which are adpressed and mostly concentrically

arranged on a yellowish background, sometimes colouring yellow when bruised, fairly thin fleshy.

G i l l s long pallid, then sometimes flesh pink, soon brownish to chocolate, finally black, never vividly rose, relatively narrow and free, with pale edge.

S t e m in youth relatively stately and deeply sunk in the earth, cylindrical, below relatively little inflated or thickened in a not large, sharply marked-off bulb, soon hollow, white or whitish, later yellow and in old age up to yellowish brownish, always considerably distant white squamose or floccose from the base to the annulus and especially in youth, in old age usually less strikingly squamose to glabrose, 10—25 cm. long and 15—25 mm. thick, at the base up to 35 mm. Ring specially stately, long covering the gills, and it is only when the pileus is hemispherical and rather large that it detaches itself from the margin of the pileus and falls like a skirt on the stem. On the underside it is strikingly floccose to crustily squamose.

F l e s h white, later rusty brownish, at the base of the stem up to rusty brown, turning very little yellow, reacting rather slightly on the cuticle and only very little or not at all on the stem, yellow with ROH, red with H_2SO_4, of pleasant anise or almond smell similar as *Ag. arvensis*.

S p o r e s ellipsoid-amygdaloid, 7,5—10 × 5—5,5 (6) µ. C h e i l o c y s t i d i a on the edge of the gills clavate, often constrictedly dissepimentose, 6—8 µ thick.

Excellent edible mushroom, growing almost exclusively in full-grown spruce forest, especially in dryer places, always in the forest or at its margin, also near clearings, for it likes warm and rather light places. In Central Bohemia it occurs fairly abundantly, though its habitats are rather scattered. In each locality it occurs generally only in a few receptacles, hardly ever in great numbers.

In his work "České houby" (1922) VELENOVSKÝ records it from Bohemia under the name of *Psalliota perrara* Bres., describes it well and gives for the spores a length of 7—8 µ, which agrees well with the diagnosis. Besides he describes however under the name of *Psalliota augusta* a fungus growing around Karlštejn, Roblín and Radotín in spruce forests on a substratum of Devonian limestones, whose description corresponds macroscopically completely to large specimens of *Psalliota augusta* but for the fact that VELENOVSKÝ reports large spores: ellipsoid, 12—15 µ long. I myself have never found in this region, which I know very well, receptacles with such large spores. Perhaps it is a squamose form of *Ag. macrosporus* M. et S.

Easily recognizable species whose determination does not offer any special difficulties. HOTSON & STUNTZ (Mycologia 30 : 228) have a very good photograph of this species under the name of *Ag. perrarus*. A. H. SMITH writes that it is probably conspecific with *Ag. macroporus* M. et S. as it is deeply rooted and *Ag. perrarus* is not. This is a mistake. The European specimens I saw are almost always deeply rooted, as is specially visible in young receptacles.

The American authors prefer the name *Agaricus perrarus* SCHULZER, as they use the designation *Agaricus augustus* FR. for a species which we report in our work as *Ag. macrosporus* M. et S.

16. Agaricus macrosporus (MOELLER et J. SCHAEFFER).

Synonymia:
Psalliota arvensis subsp. *macrospora* MOELL. et SCHAEFFER.
Psalliota villatica sensu LANGE non alliorum.
Psalliota augusta sensu RICKEN (non Fries) — DVOŘÁK, icon in Mycologia, vol. 4, 1927.
Psalliota collina VELENOVSKÝ, Novitates Myc. p. 152, 1939 — Nov. Myc. Noviss. p. 82, 1947.

Large, fleshy fungus, with a compact pileus measuring up to 25 cm in diameter, belonging to the close affinity of *Agaricus arvensis* SCHAEFFER. Its pileus is white or with a slight yellowish-greenish tinge, turning ochraceous yellow after scratching, is dry and dull or a little silkily smoothly fibrillose, long campanulate-hemispherical and closed.

Gills long pallid, grayish reddish, then chocolate gray, crowded and relatively narrow.

Stem white, later yellowish or brownish spotted, beset with often circular remnants of the velum, thick and short, not longer than the diameter of the pileus, long full, then hollow. Ring rather stately, cracking radially and a little brownish at the margin.

Flesh white, in wounded places in old age strongly rusty brown, especially at the base of the stem — of a pleasant smell and taste of anise, but perhaps less constantly so than *Ag. arvensis* SCHAEFFER.

Spores ellipsoid, 10—12 (14) × 6—6,5 (7) µ. Basidia tetrasporic. Cheilocystidia relatively short.

Hab. On pastures and on the margin of fields. Description shortened after JUL. SCHAEFFER. I saw living only one large adult receptacle found at Kašperské Hory in Bohemia on Sept. 15, 1949, by Mrs. KNAPPOVÁ. It grew in a thin grassy spruce forest near the Vydra River (one specimen only). The pileus was entirely mature and measured 27 cm. in diameter. On the whole it looked like a large Ag. arvensis with a thick and relatively shorter stem. Spores 11—14 × 6—7 µ.

To this species belong also the large receptacles deposited in the herbarium of the National Museum in Prague, No. 29 380, a stately specimen with the pileus even in the exsiccated state measuring 20 cm. in diameter, with a relatively short and fleshy stem. The dried receptacle has an almost smooth, yellowish cuticle. Stem not thickened below, rather pointed, fleshy. G. JAPP collected it at Česká Lípa in 1935. Spores ellipsoid-amygdaloid, 13—14,5 × 6—7,3 µ.

The second receptacle was found by J. PETRBOK, also at Česká Lípa, IX. 1938. This dried specimen measures 22 cm. in diameter. The pileus is very fleshy, with adpressed, imbricate and subconcentric squamules, in the middle deeply cracked-areolate. Stem thick, shorter than the diameter of the pileus. Spores ellipsoid-amygdaloid, 13—16 × 6—6,5 µ. Macroscopically it is reminiscent of *Agaricus Bernardi*, but the pileus is more minutely squamose and the spores are large.

Psalliota collina VELENOVSKÝ, Novitates Mycologicae p. 152, 1939, Novitates Mycol. Noviss. p. 82, 1947, is conspecific with *Agaricus macrosporus* M. et S. As VELENOVSKÝ writes this species grows abundantly on the warm grassy hills round Mnichovice, in the association of *Orchis Morio, Festuca ovina, Helianthemum, Thymus*. The spores are oblong-ellipsoid, 8—12 µ long.

JUL. SCHAEFFER identifies with Agaricus macrosporus also *Psalliota augusta* in the sense of RICKEN — perhaps rightly. According to Ricken's description the fungus differs in its soon imbricate-squamose pileus and in the place of its occurrence as it grows on accumulated needles in the forests. This report agrees with the Bohemian specimen from Kašperské Hory except for the latter being only finely squamose. The fungus figured in colours in the journal Mykologia, vol. IV, 1927, under the name of *Psalliota augusta* seems also to belong here. It was found and painted by B. DVOŘÁK at Hořice.

Conspecific is also *Psalliota villatica* sensu LANGE, Fl. Ag. Dan. t. 139 C, 4 : 56, 1939. Though LANGE regards his fungus to be conspecific with *Psalliota villatica* Bresadola, Ic. Myc. t. 829, yet I believe that the two fungi are not conspecific, for BRESADOLA says of the flesh "caro in stipite fracta ochraceo-sublateritia, odore subnauseoso", which agrees more with *Agaricus urinasceus* J. SCHAEFFER. Bresadola's fungus has spores of 12—14 × 6—8 µ.

The American authors, especially A. H. SMITH and HOTSON & STUNTZ, describe *Agaricus macrosporus* M. et S. under the name of *Agaricus augustus* Fr. The Americans generally designate more squamose forms as *Agaricus crocodilinus* MURRILL. A good photograph was published f. inst. by A. H. SMITH (Pap. Michig. Ac. 25: 115, tab. I—II). (Spores 8—11 × 5,5—7 µ, but also up to 12—16 × 7—8 µ.)

A. H. SMITH suggests that the receptacles figured by HOTSON & STUNTZ (Mycologia 30 : 226, fig. 8, 1938) under the name of *Agaricus villaticus* may belong rather to this species, as indicated also by the spores, which measure 8—10 × 5—6 µ. The fungus of HOTSON & STUNTZ is of course much more squamose than *Agaricus macrosporus* normally is — but the other characters are fairly similar, so that the view of SMITH is probably correct.

With the *Agaricus villaticus* of BRESADOLA and apparently also of QUÉLET is probably conspecific *Psalliota urinascens* JULIUS SCHAEFFER et MOELLER (Ann. Myc. 36 : 79, 1938), which according to the description is very similar to *Agaricus macrosporus*, has spores of 8—11 × 5,5—6,5 µ, but smells like horse urine. The pileus is white, almost smooth, the ring below floccose, and the flesh reddish rusty. The cuticle of the pileus does not turn yellow, and it shows the same chemical reactions as *Agaricus campester* into whose close affinity it also belongs. It was found several times in Denmark.

To the close affinity of *Agaricus macrosporus* S. et M. belongs *Agaricus stramineus* J. SCHAEFFER et MOELLER (Ann. Myc. 36 : 78, 1938). It differs from the former by the umbery-ochraceous pileus, which soon tears into concentric squamules and remains non-shiny on the apex like *Lactarius helvus*. Stem concolore, all hirsute-floccose or

squamose-circled, short, thick or ventricose-fusiform. Pleasant smell, but not of anise. Spores 10—14 (16) × 6—7 µ. Basidia tetrasporic. Cuticle turning yellow when wounded. Gills long pallid as in *Agaricus macrosporus* S. et M. It was found in pastures in Schleswig-Holstein and in Denmark (Sjaelland, leg. Moeller). It is perhaps conspecific with *Agaricus lepiotoides* R. SCHULZ (Michael Schulz, Führer für Pilzfreunde, t. 50).

17. **Agaricus cretaceus** FRIES, S. M. 1 : 280, 1821, sensu RICKEN. (Tab. XIII.)

Synonymia:

Psalliota arvensis QUÉL. 1872. — KONRAD et MAUBLANC, Ic. Sel. Fung. p. 58. — LANGE Fl. Ag. Dan. 5 : 57, t. 138 A. — BURB, Icones Farlowianae t. 60, 1929.
Pratella arvensis GILLET 1878.
Agaricus edulis KROMBH. 1836.
Agaricus exquisitus VITTADINI 1836 teste KONRAD et MAUBLANC non Julius Schaeffer 1938.
Psalliota cretacea RICKEN, Blätterp. p. 236 t. 61, f. 7.

Large and stately fleshy fungus, with the pileus 9—27 cm. in diameter, white or creamy white, in old age whitish yellowish alutaceous, almost smooth, dull, in youth subglobose, then long hemispherical- campanulate to campanulate-expanded, later almost plane.

Gills long whitish, then when the pileus is already broadly expanded pale dirty flesh pink, in old age chocolate to dark chocolate, less deliquescent than in *Agaricus arvensis* SCHAEFFER.

Stem smooth, in youth only slightly floccose-squamose, soon glabrose, much smoother than in *Ag. arvensis*, relatively thicker and shorter, truncated at the base, but in the marginate bulb mostly not thickened or only slightly. White or sligthly yellowish, little hollow, not blackening above even in old age.

Ring stately, double, on the underside cracking stellately, generally thick and membranaceous.

Flesh white, later slightly yellowish, or in youth when wounded almost not turning yellow or only very little. Pileus in old age colouring yellowish, but less than in *Ag. arvensis*. Flesh smelling slightly of anise.

Cystidia on the edge broadly obovate to subspherical, 10—18 µ broad.

Spores 7,5—9 × 4,5—5,5 µ (according to Lange 6,5—7,5 × 4—4,75 µ).

Hab.: Sporadically on the border of forests, under bushes, or in copses among the grass and herbs, or in other places outside the forest. It is not characteristically a forest type, though it may occur also in light forests. Much rarer than Ag. arvensis. In Bohemia I found beautiful receptacles at Černolice in the copse on the border of the forest, 20. VII. 1950, and unfar from there Mr. Zdeněk Pouzar collected it in the same month in the garden of Messrs. Stivín.

In his Systema Mycologicum 1821 Fries describes this species while placing SCHAEFFER'S *Ag. arvensis* to the synonymia of *Ag. campestris* L. *Ag. cretaceus* FRIES belongs to the circle of weak species

around *Ag. arvensis* SCHAEFF., but I think that it is different. At least it is rather different from the typical *Ag. arvensis* SCHAEFF. in our sense. The half-opened receptacles strikingly resemble *Lepiota naucina*. — Therefore some authors consider the figuring of FRIES in Aetl. Svamp. tab. 39 to be *L. naucina*. But FRIES describes his fungus correctly as *Agaricus*. This fungus is in the half-opened state so similar to *Lepiota naucina* that when I first collected it I myself mistook it for *L. naucina*, and only at home, when the gills had already darkened, I recognised it as *Agaricus*. Thus there is no reason to suspect FRIES to have described *Lepiota naucina* under the name of *Ag. cretaceus*.

It is true that the figuring cited of *Agaricus cretaceus* in Aetl. Svampar by FRIES is very bad and not particularly similar to our fungus. But it must be remembered that most figurings in this work are bad, so that we can scarcely recognise many common and indubitable species according to his figures. Thus we have also in this case to rely more on the description of FRIES than on the figure, which probably was not even painted by *Fries* himself.

The receptacles attain remarkable sizes. Most of them are larger than *Agaricus arvensis*. On 24. IX. 1950 a receptacle of this species was brought to the exhibition of fungi held in the National Museum; its pileus measured 25 cm. in diameter. Spores 7,5—8,5 × 5 µ. It had been collected in Bohemia, but I could not ascertain the locality.

The fungus which the American mycologists, f. inst. A. H. SMITH and HOTSON & STUNTZ, give as *Agaricus arvensis* SCHAEFFER is rather identical with *Agaricus cretaceus* FR. in our sence. Its spores are 7—9 (10) × 5—6 µ. It has a smooth stem and grows most often in pastures. The same applies to the figure of *Agaricus arvensis* in BURT: Icones Farlowianae, t. 60. Spores 7—8 × 4—5 µ.

18. **Agaricus osecanus** PILÁT sp. n. (Fig. 41—42.)

Pileus in youth slightly conical-globose, them plane convex, in maturity up to 10 cm. in diameter, almost chamois dull, slightly silkily shiny, cracked into very fine squamules, especially in the middle third, towards the margin more fibrillose than squamose, relatively thickly and fairly firmly fleshy, white with a slightly yellowish tinge — similar as in Ag. arvensis, but much less so, in the middle sometimes a little whitish grayish, at the margin long slightly involute and with dented fragments of the velum.

Stem relatively short and thin, 5—6 cm. long, 1,3—1,7 cm. thick, cylindrical, at the base slightly clavate-thickened, but without bulb, at the base itself rounded, not flatly truncated, pure white, above the ring finely silkily fibrollose, below the ring subsquamose, at the base often with squamules, which sometimes form incomplete circles, turning slightly dirty yellowish at the base where bruised.

Ring stately, of two layers, below coarsely crustily squamose, above white, glabrose, but slightly wrinkled, dented at the margin as part of the velum remains in the form of tatters at the margin of the

Photo A. Pilát.

Fig. 41. *Agaricus osecanus* PILÁT.
Bohemia: Velký Osek, in silvis frondosis udis, 21. IX. 1950, leg. Dr. M. Deyl. ⅔ orig.

pileus, relatively tough and long persistent, white.

Gills in youth, when the pileus is still closed by the velum, grayish, then grayish flesh to chocolate, never vividly rose, — similar as in *Ag. arvensis.*

Flesh in a cut turning yellow only quite slightly and very gradually — much less so than in *Ag. arvensis,* cuticle of the pileus and stem turning slightly yellow and only after a long time when scratched, — with KOH at once vividly chrome-yellow, slight smell only of anise, taste not pronounced.

Spores globose-ellipsoid, much more globose than in *Ag. arvensis,* 7—7,5 × 5,5 µ.

Cheilocystidia ovoid-pyriform, thin-walled. Basidia tetrasporic.

Hab. In the grass in moist deciduous woods. At Velký Osek (east

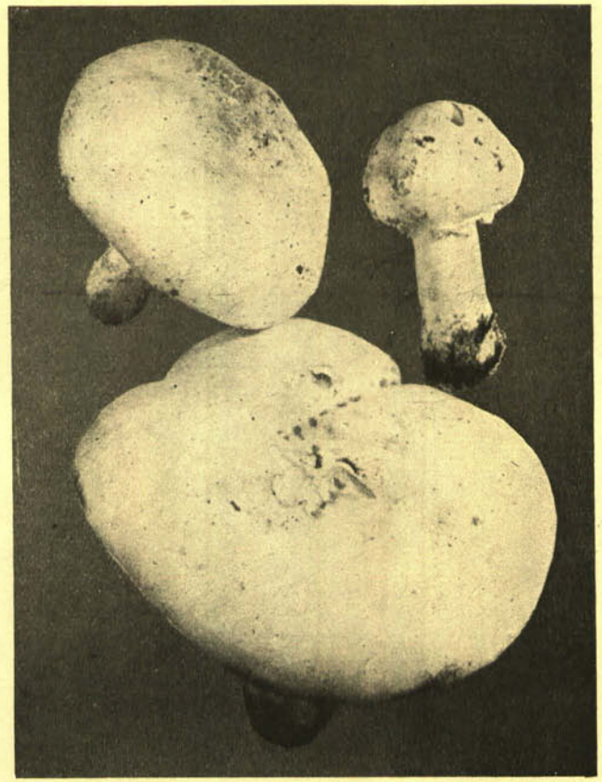

Photo A. Pilát.

Fig. 42. *Agaricus osecanus* PILÁT.
Bohemia: Velký Osek, in silvis frondosis udis, 21. IX. 1950, leg. Dr. M. Deyl. ½ orig.

of Prague) Dr Miloš Deyl collected, 20. IX. 1950, four receptacles in different stages of development. It is close to *Ag. arvensis* (exquisitus Vitt. sensu J. Schaeffer), but turns less yellow, has a strikingly thin and short stem, a strikingly stately ring, and smaller but rounder spores. It is close to Ag. cretaceus in our sense. The constancy of these three species will still have to be investigated before deciding finally on their systematic value.

19. **Agaricus arvensis** FR. ex SCHAEFFER. (Fig. 43—45.)

Synonymia:

Psalliota arvensis (SCHAEFFER) ? QUÉLET. — SCHROETER 1889. — VELENOVSKÝ, České houby, p. 559, 1921. — Icon in Mykologia, vol. I, 1924 (B. DVOŘÁK pinxit).
Psalliota arvensis subsp. *exquisita* (VITT.) sensu JUL. SCHAEFFER, Führer für Pilzfreunde, tab. 55 p. p.

6*

Photo A. Pilát.

Fig. 43. *Agaricus arvensis* SCHAEFFER.
Bohemia: Karlštejn, in Picetis solo calcareo, 26. IX. 1950, leg. A. Pilát.
⅔ orig. Specimina iuvenilia.

P i l e u s 8—15 (20) cm. in diameter, first globose-conical, generally with flattened apex and generally somewhat bent, then campanulate and at the apex generally plane, later plane-expanded or also with subelevated margin, in youth white, but more often already from youth a slight yellowish tinge, then generally more or less creamy yellowish when fresh, especially in youth on stem and pileus rather quickly turning yellov (but the yellow places colour fairly quickly brownish rusty), in youth silky and slightly silkily shiny, but also in youth finely floccose-squamose, later smooth, but sometimes also in

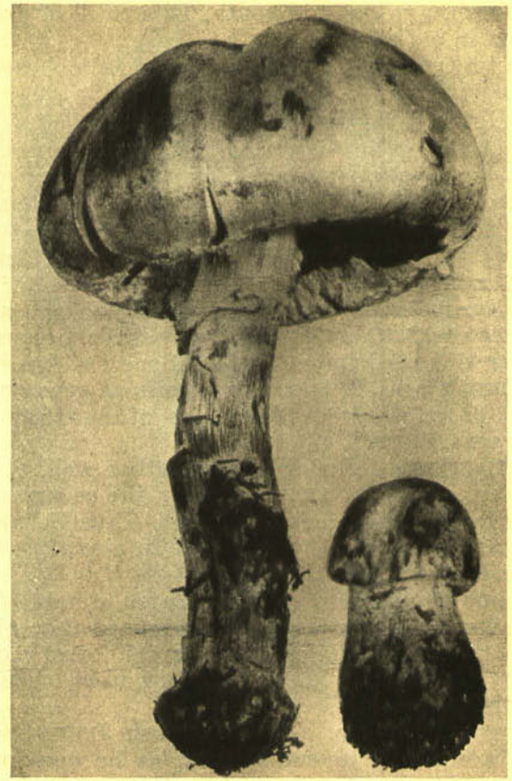

Photo A. Pilát.

Fig. 44. *Agaricus arvensis* SCHAEFFER.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. A. Pilát. ½ orig.

maturity — especially in fairly dry weather — squamose, in old age generally smooth and shiny.

S t e m solid, then hollow, rather tall, later turning black from the tip, yellowish rusty, above generally subattenuated, or entirely cylindrical, but at the base generally swollen to a sharply marked-off bulb, which is flat below, more rarely without a bulb at the base, but always flat below as if truncate, 7—12 cm. long and 1,5—2,5 cm., below up to 3,5 cm. thick.

R i n g membranaceous, generally thin, later pendulose and adhering to the stem, mostly less distinctly double, below flat floccose-squamose, white then cream.

G i l l s dirty whitish, then grayish pink, finally reddish brown to black, crowded, free, deliquescent in old age.

F l e s h firm, white, turning yellow in the air, but the yellow colouring soon turns brownish rusty chiefly at the surface, pleasant smell

of anise when fresh, especially in youth. This smell of anise is soon lost in withering and in old age.

Basidia tetrasporic, Cheilocystidia globose-clavate, 8—10 µ thick.

Spores ellipsoid, 8—10 (11) × 5—5 µ.

Hab. Almost always in forests, especially in spruce forests, much rarer in deciduous woods. Specially abundant in spruce forests on a limestone substratum. Here and there it grows of course abundantly enough also on non-calcareous soils.

Utilisation. Excellent edible fungus, almost better than the cultivated mushrooms.

In Central European literature it is generally given under the name of *Agaricus arvensis* SCHAEFFER, rightly I believe, because SCHAEFFER'S two plates figure this predominantly forest species. But in the Systema Mycologicum FRIES places SCHAEFFER's species as synonym to *Agaricus campestris* and describes from the group of Agaricus arvensis only *Agaricus cretaceus* FRIES.

Though SCHAEFFER's figuring agrees rather well, the same cannot be said of the text, for SCHAEFFER writes on the occurrence "in pascuis et pratis elatioribus ac silvaticis autumno". Thus Schaeffer evidently includes in the species as understood by him also *Agaricus cretaceus* FR. and perhaps also other species.

Also the name of *Agaricus arvensis* is not suitable for this almost exclusively forest species, and it must be assumed that when describing SCHAEFFER had not especially in mind the larger forest mushroom which we designate by the name which SCHAEFFER used, though it is well figured in his plate.

Psalliota arvensis subsp. *exquisita* sensu JULIUS SCHAEFFER does not correspond accurately to our fungus, as he does not distinguish *Agaricus arvensis* in our sense from *Ag. cretaceus* and considers these two fungi conspecific. They are incontestably very close to each other, nevertheless I believe that they represent two different species, even though I admit that for the present they are badly characterised. But perhaps more and more reliable criteria will be found when a larger material is investigated.

From the forests at Slapy south of Prague I received from Dr. DOSTÁL receptacles which were striking by the ochraceous yellowish orange coloration of pileus and stem. Young and old receptacles had the same coloration. By their habitus they corresponded well to *Agaricus silvicola* (VITT.) as figured by KONRAD et MAUBLANC in their Icones Selectae Fungorum — but they had larger spores. I measured 7,5—9(10) × 5—6 µ. Konrad et Maublanc record for their Agaricus silvicola 6—8 × 3—5 µ. Perhaps it is only an atmospheric form of Agaricus arvensis or formed under the influence of the habitat, for the receptacles grew on compost from forest soil at the forest nursery.

HOTSON & STUNTZ describe from western North America *Agaricus arvensis* SCHAEFFER and give for this species the spores according to American receptacles with 7—10,5 × 4,5—5,5 µ. The photograph of these authors is published in the journal Mycologia 30: 232, 1938. In the

Photo A. Pilát.

Fig. 45. *Agaricus arvensis* SCHAEFFER.
Bohemia: Karlštejn, in Picetis solo calcareo, 3. IX. 1950, leg. A. Pilát.
Specimen adultum. ½ orig.

State of Washington it is much rarer than *Ag. silvicola* VITT. It seems to me that the American fungus is rather conspecific with *Agaricus cretaceous* FR. in our sense, as it has a smooth stem and grows in pastures. The same applies to *Agaricus arvensis* in BURT, Icones Farlowianae, t. 60.

Agaricus arvensis var. **macrolepis** PILÁT et POUZAR.
(Fig. 46—48.)

? Agaricus arvensis sensu FRIES, Aetl. Svampar IV.
? Psalliota odoratissima VEL., České houby, p. 566, 1921.

Of intermediary habitus between Agaricus arvensis and Ag. augustus. From the latter species it differs by the coarser squamules, which are however less coloured, and by the stem being provided at the base with a sharply marked-off, subglobose bulb flattened on the

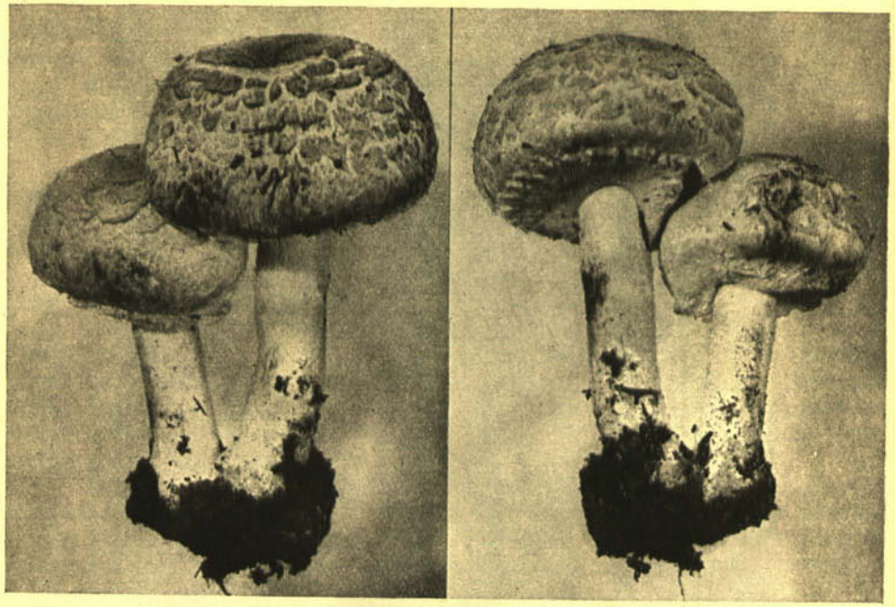

Photo A. Pilát.

Fig. 46. *Agaricus arvensis* var. *macrolepis* PIL. et POUZ.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. Pilát et Pouzar.
Specimina iuvenilia. ½ orig.

underside, and by the ring being less ochraceous floccose-squamose on the underside. The stem is only a little and especially only in its lower half squamose.

P i l e u s 6—11 cm. in diameter, in youth more than hemispherical, with the margin rounded below and connected with the stem by a stately, membranaceous ring, which is later skirt-like pendulate, not umbonate at the apex, cracked already in youth into imbricate to subconcentric and adpressed squamules, which are slightly distant only at the tips, non-squamose only at the apex. Ground-colour white, in wet weather light ochraceous, turning in maturity into ochraceous with a slight rusty tinge.

G i l l s in youth grayish reddish, then dirty brownish, later dirty chocolate to black, of the same colouring as in Ag. arvensis or augustus, never vividly rosy, and in maturity sharply marked-off from the stem.

S t e m relatively short, 7—11 cm. long, mostly regularly cylindrical and terete, in the lower third slightly thickened and at the base with a sharply marked-off, globose, slightly flattened basal bulb, white to slightly dirty brownish tinged to yellowish, turning slightly yellowish brown where bruised, covered especially in the lower half with floccose squamules, which are mostly larger than in Ag. arvensis, but finer than in Ag. augustus.

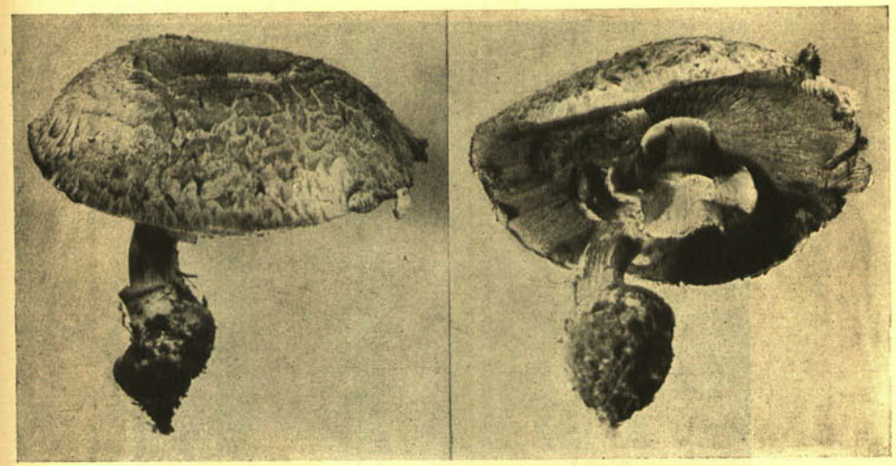

Photo A. Pilát.

Fig. 47. *Agaricus arvensis* var. *macrolepis* PIL. et POUZ.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. Pilát et Pouzar.
Specimen adultum, ⅓ orig.

Ring stately, double, on the underside at the margin cracked radially into coarse squamules, which are at their ends slightly yellowish brownish coloured and stand mostly in one row, otherwise white or whitish and almost smooth.

F l e s h of anise smell just as in Ag. arvensis, and also as in the latter turning yellow after scratching and in old age, but slightly less intensively.

Squamules on the pileus of thin-walled hyphae as in Ag. augustus and Ag. arvensis. Basidia tetrasporic.

S p o r e s ovoid-ellipsoid, with slightly obliquely sitting apicule, 9—9,5 × 5—5,5 µ.

Hab. in a spruce forest on limestone substratum at Karlštejn—Boubová, 9-VIII-1950, leg. PILÁT and POUZAR. We found 4 specimens. In the immediate neighbourhood grew *Ag. arvensis* subsp. *exquisitus* VITT. as well as *Ag. augustus*, so that we could compare them on the spot with these two species. POUZAR found at the same place, 1-X-1950, two further receptacles with an almost white and less strikingly squamose pileus.

Our variety is close to Ag. arvensis, which is very variable, or rather a series of weak species belongs here, whose systematic value is in many respects not yet elucidated. Our fungus is also close to *Agaricus stramineus* J. SCHAEFFER et MOELLER, Annales Mycologici 1938, 36: 78, which differs from Ag. arvensis by its umber-ochraceous pileus soon cracking into hairs or concentric squamules and by its non-shiny disc as in *Lactarius helvus*, by its concolore stem, which is hirsute-floccose or circularly squamose on the whole surface, short and attenuated or ventricose-fusiform, and by its rather pleasant smell, but not of anise.

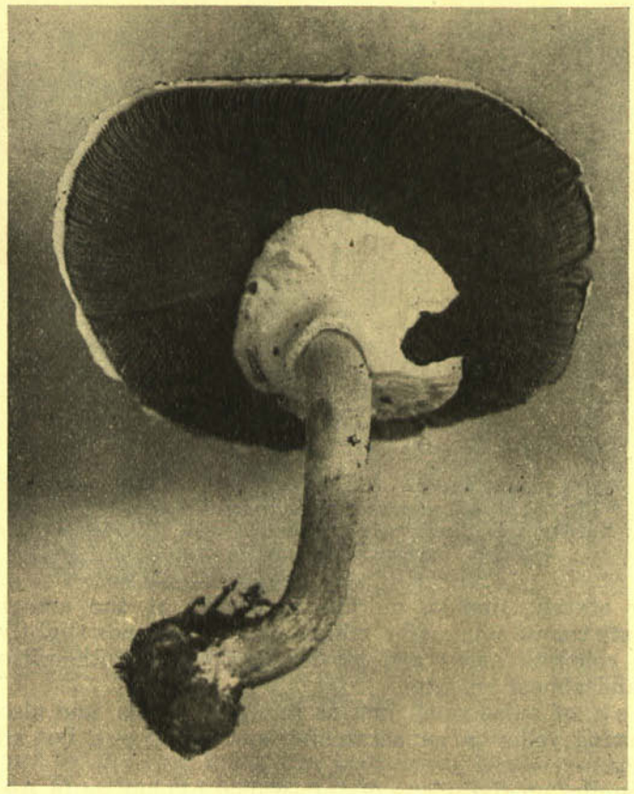

Photo A. Pilát.

Fig. 48. *Agaricus arvensis* var. *macrolepis* PIL. et POUZ.
Bohemia: Karlštejn, in Picetis solo calcareo, 1. X. 1950, leg. Zdeněk Pouzar.
Specimen adultum, ⅔ orig.

Our fungus differs from *Agaricus stramineus* S. et M. by its coarsely squamose pileus, by the stem inflated below into a globose, sharply marked-off and on the underside flattened bulb, and by its distinct smell of anise as in Ag. arvensis. Of course *Ag. stramineus* J. SCHAEFFER has much larger spores (10—16 × 6—7 µ).

20. **Agaricus silvicola** (VITTADINI) SACCARDO 1887 — KONRAD et MAUBLANC XXX Ic. Sel. Fung. pl. 29. (Fig. 49—53.)

Synonymia:

Agaricus campestris var. *silvicola* VITTADINI 1835.
Pratella campestris var. *silvicola* GILLET 1878.
Pratella arvensis var. *acicola* QUÉL. 1886.
Pratella flavescens GILLET 1878 (non RICHON et ROZE, nec QUÉL.).
Agaricus arvensis SCHAEFF. 1774.

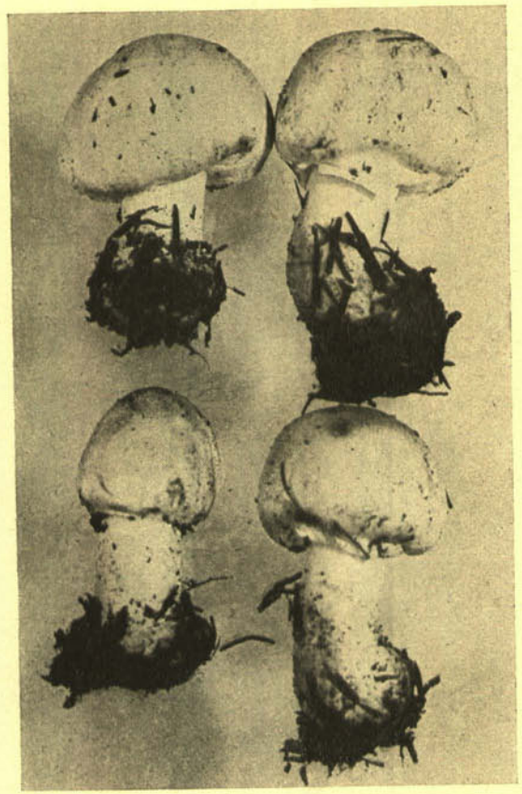

Photo A. Pilát.

Fig. 49. *Agaricus silvicola* (VITT.) J. SCHAEFF.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950,
leg. A. Pilát jun. Specimina iuvenilia. ⅔ orig.

Pratella arvensis QUÉL. 1872.
? Psalliota arvensis RICKEN, Blätterpilze, p. 236, p. 62, f. 2, 1914 p. p.
Psalliota silvicola LANGE, Fl. Ag. Dan. t. 138 B.
Psalliota arvensis subsp. *silvicola* (VITT.) J. SCHAEFFER, Führer für Pilzfreunde, t. 56.
Agaricus edulis BULL. 1790, p. p., PERSOON 1801, p. p. teste KONR. et MAUBL. SÉCRETAN 1833.
Agaricus arvensis var. *abruptus* PECK 1896.
Agaricus abruptus PECK 1904.
Agaricus abruptibulbus PECK 1904.

P i l e u s while in bud subglobose or only slightly obtusely conical, 3,5 cm. in diameter, then up to plane-expanded and 7—9 cm. in diameter, much smaller and thinner fleshy than in Ag. arvensis, with a silkily shiny, sometimes slightly finely silkily squamose-floccose cuticle, white, but not pure white, but with a slight yellowish tinge, turning slightly yellowish where scratched and in old age, in old age silky, slightly

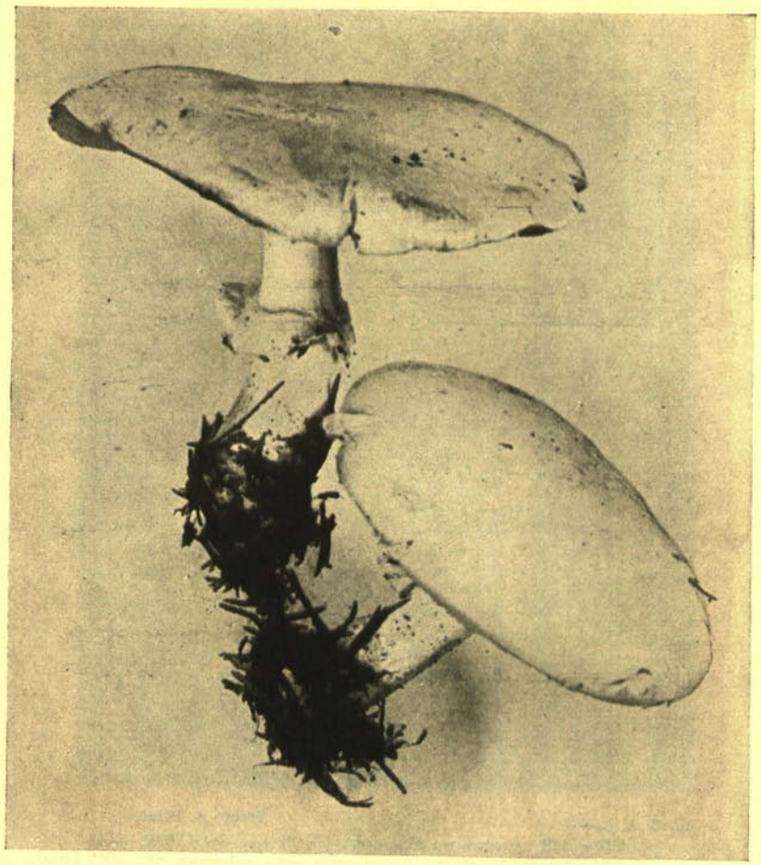

Photo A. Pilát.

Fig. 50. *Agaricus silvicola* (VITT.) J. SCHAEFF.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950,
leg. A. Pilát jun. Specimina adulta. 1/1 orig.

fibrillose-squamose to glabrose, almost non umbonate, exceeding the gills by about 1—1,5 mm. at the margin.

Stem of mature receptacles 6—8 cm. long, thinner below the pileus, downwards gradually conically widening, and at the base with a sharply marked-off, below flat bulb, above 1 cm., below up to 1,5—1,8 cm., bulb up to 2,5 cm. thick, and here also slightly yellower than above at the tip where it is only slightly smoky dirty, otherwise entirely white, above the ring silkily fibrillose, below the ring almost smooth, only with sparse detached fibrils, so that it is scattered fibrillose-squamose.

Ring white, double, more slightly developed than in Ag. arvensis,

Photo A. Pilát.

Fig. 51. *Agaricus silvicola* (VITT.) J. SCHAEFF.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950,
leg. A. Pilát jun. 2/3 orig.

often below coarsely squamose-crusty or floccose, with the lower layer radially torn.

Gills first whitish, soon grayish with a flesh tinge, then grayish chocolate to almost black, never vividly rosy.

Flesh smelling of anise, of pleasant taste. Cuticle of the pileus and stem turning vividly yellow where scratched, as in Ag. arvensis.

Basidia tetrasporic, 18—22 × 7—7,5 µ. Cheilocystidia ellipsoid-pyriform to clavate, about 13 × 22—30 µ.

Strongly resembling *Agaricus arvensis* SCHAEFF., but smaller and with the spores ovoid-ellipsoid, 5,7—6,3 × 3,4—3,8 µ.

Hab. In spruce forests on fallen needles, fairly rare and later in autumn than *Ag. arvensis*, chiefly in the second half of September and in October. In spruce forest on limestone substratum at Karlštejn—Boubová, 20-IX-1950, I found 17 receptacles together. J. PETRBOK found

Photo A. Pilát.

Fig. 52. *Agaricus silvicola* (VITT.) J. SCHAEFF.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. A. Pilát jun. ¾ orig.

it, 22. IX. 1950, under a spruce on the "Zlatý kůň" hill at Koněprusy on limestone substratum, A. PILÁT ibid. 28-IX.

Ag. silvicola sensu J. SCHAEFFER is not a depauperised form of the common *Agaricus arvensis*, which has spores of 8—10 × 5—6 µ. It occurs always in the same habitus and grows often together in the same forest and at the same time with *Agaricus arvensis* SCHAEFFER. From the same mycelium grow always the same receptacles. I have never seen transitions. In the vicinity of Prague *Ag. silvicola* is much rarer than *Ag. arvensis* (with large spores). This applies especially to the area west of Prague where the forests are on a limestone substratum, where both species grow, but *Ag. silvicola* begins to appear only in September, whereas *arvensis* grows much more abundantly and already in summer. The Bohemian fungi agree completely with JUL. SCHAEFFER's description, who describes and figures this fungus in MICHAEL-HENNING-SCHAEFFER, Führer für Pilzfreunde, on pl. 56, to the left.

Photo A. Pilát.

Fig. 53. *Agaricus silvicola* (VITT.) J. SCHAEFF.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. A. Pilát jun. ¾ orig.

This species is confused by most authors with *Agaricus arvensis* SCHAEFFER and their descriptions refer generally to both species.

A good description and photograph of the receptacles of *Agaricus silvicola* VITT. from western North America (State of Washington) are given by HOTSON & STUNTZ (Mycologia 30:233, 1938). The spores of the American receptacles measure 6—8 × 3—5 µ. In the State of Washington it is much more abundant than *Agaricus arvensis* SCHAEFFER with spores of 7—10,5 × 5,5—5,5 µ, which is rare. Both species are, as the two authors cited remark, very close to each other and differ chiefly in the size of the receptacles, the measurements of the spores and perhaps also in the quality of the ring. They say they have found also transition forms between these two species. The same can be said about the European receptacles. *Agaricus silvicola* VITT. is better known from North America under the name of *Agaricus abruptibulbus*, as it was described by PECK. This is a mere synonym. The character of the

Photo A. Pilát.

Fig. 54. *Agaricus rubellus* (GILL.) SACC.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. A. Pilát. 5/4 orig. Specimina iuvenilia.

basal bulb of the stem varies greatly. Spores of PECK's type according to A. H. SMITH: 5,5—6,5 × 4—4,5 µ. BURT figures under the same name in Icones Farlowianae, t. 61, a fungus with spores 7—8 × 4—5 µ, which has the pileus 8—12 cm. in diameter, and which corresponds rather to the European specimens of *Agaricus arvensis* SCHAEFFER.

21. **Agaricus rubellus** (GILL.) SACC. (Fig. 54—57, 58b.)

Synonymia:

Pratella rubella GILLET, Les Champignons en France, p. 565, t. 102, 1878.
Agaricus rubellus (GILL.) SACC., Sylloge Fung. 5 : 1007, 1887.
Psalliota rubella GILL. f. *pallens* LANGE, Fl. Ag. Dan. 4 : 61 t. 137 A, 1939.

Photo A. Pilát.

Fig. 55. *Agaricus rubellus* (GILL.) SACC.
Bohemia: Hodkovičky prope Pragam, 13. X. 1937, leg. Dr. J. Herink. 1/1 orig.

Psalliota semota sensu RICKEN, Blätt. p. 228 t. 62 f. 3, 1915, — VELENOVSKÝ, České houby, p. 566, 1921 (non Fries).
? *Psalliota suvaveolens* VELENOVSKÝ, Novit. Mycol. Novis., p. 82, 1947.
? *Psalliota umbrosa* VELENOVSKÝ, Novit. Mycol. Novis., p. 82, 1947.
? *Psalliota dulcidula* SCHULZER apud KALCHBRENNER, Hym. Hung. p. 29, t. 17, f. 1, 1873 (non Lange).

Pileus 4—6 cm., convex to subconical-convex, then fairly plane, obtusely umbonate or also not umbonate, in youth often white, then covered with reddish purple to reddish violet or reddish brown, adpressed, fibrillose scales, especially in the centre where they are often continuous, and thus the centre of the pileus is fairly dark reddish brown, but at other times much lighter. Towards the margin almost always lighter, sometimes only pale rosy or also whitish.

Gills numerous, free, thin, ventricose, first whitish, then pale, brown reddish, pale flesh to brownish black, but not vividly rosy.

Stem white, upwards towards the ring subfloccose, thickened towards the base either gradually, or also below bulbosely thickened, more rarely subcylindrical, later with a pale tawny yellowish tinge. The ring, situated in the middle of the stem, is white, thinly membranaceous and soon fugaceous.

Photo A. Pilát.

Fig. 56. *Agaricus rubellus* (GILL.) SACC.
Bohemia: Hodkovičky prope Pragam, 13. X. 1937, leg. Dr. J. Herink. 1/1 orig.

Flesh white, mostly of indifferent smell and taste, turning yellow where scratched in the whole receptacle, but especially in the lower part of the stem.

Basidia tetrasporic. Cheilocystidia obovate, not striking, 5—6 μ thick.

Spores short ovoid, 5—5,5 × 3—3,5 μ.

Hab. generally individually in coniferous forests, more rarely also in deciduous forests. In the spruce forests of Karlštejn in some years fairly abundant. Collected by VELENOVSKÝ at Jirny, Trnová and in many other places.

It is very close to *Ag. semotus*. Perhaps it is only a large race of this species. It grows mostly individually, *Ag. semotus* generally in crowds.

Ag. dulcidulus SCHULZER in KALCHBRENNER, Hym. Hung. t. 17, f. 1, has in the figure cited the pileus more yellow than is generally the case in this species. Thus it might also be conspecific with *Ag. rusiophyllus* LASCH. But in my opinion the description fits better *Ag. rubellus*. In that case SCHULZER's name would have priority, but as his species is not quite clear I prefer GILLET's name, as he described and figured this fungus well.

Photo A. Pilát.

Fig. 57. *Agaricus rubellus* (GILL.) SACC.
Bohemia: Karlštejn-Boubová, in Picetis solo calcareo, 20. IX. 1950, leg. A. Pilát. 2/3 orig.

Of the American species *Agaricus micromegethus* PECK, Ann. Rep. N. Y. State Mus. 54: 152, 1901 (as *Ag. pusillus*) — Ann. Rep. N. Y. State Mus. 94: 36, 1905, cf. HOTSON & STUNTZ, Mycologia 30: 206, 1938, fig. 3 — is conspecific or closely related. It has spores of 5—6 × 4—4,5 μ, pileus 4,5 cm. in diameter, and stem 40 × 8 mm. Sometimes it looks like a miniature *Agaricus arvensis* SCHAEFFER.

22. **Agaricus semotus** FR. (Fig. 59.)

Synonymia:

Ag. semotus FRIES Mon. Hym. 2 : 347, 1863. — Hym. Eur. p. 282, 1874. (non RICKEN nec VELENOVSKÝ).
Psalliota silvatica var. *amethystina* QUÉL. 1884.
Agaricus amethystinus (QUÉL.) LANGE Fl. Ag. Dan. 4 : 61, t. 135 A, 1939.

Photo A. Pilát.

Fig. 58 a) *Agaricus campester* Fr. ex L.
Bohemia: Černolice prope Dobřichovice, in horto meo loco graminoso, 10. VII. 1950, leg. A. Pilát jun. Specimen iuvenile. 1/1 orig.

b) *Agaricus rubellus* (Gill.) Sacc.
Bohemia: Karlštejn, in Picetis solo calcareo, 3. VIII. 1950, leg. A. Pilát. 1/1 orig.

? *Psalliota duriuscula* Velenovský, Novit. Mycol. Novis. p. 83, 1947 (non Roze et Richon).

Pileus 1,5—3 cm. in diameter, campanulate convex, then expanded, generally umbonate, but also even depressed, entirely covered with wine-red brownish, very fine, fibrillose and adpressed squamules, which are more crowded at the apex, sparser towards the margin of the pileus; therefore the pileus is at the apex rusty reddish brown to impure wine coloured, towards the margin whitish, so that between the apex and the marginal half there is generally a striking colour contrast, sometimes however entirely white and at the apex only slightly violet purple. In youth in the marginal half the fibrils are sometimes yellowish so that the margin is dirty whitish, otherwise thin, membranaceous, and in youth bent to the gills or involute.

Stem about 25—30 × 3—6 mm., attenuated above, below the ring and on its underside generally with floccose fibrils which turn yellow or slightly reddish, above the ring white, slightly finely and shinily silkily fibrillose, below slightly thickened, at the base generally flat, hardly ever more markedly bulbosely thickened.

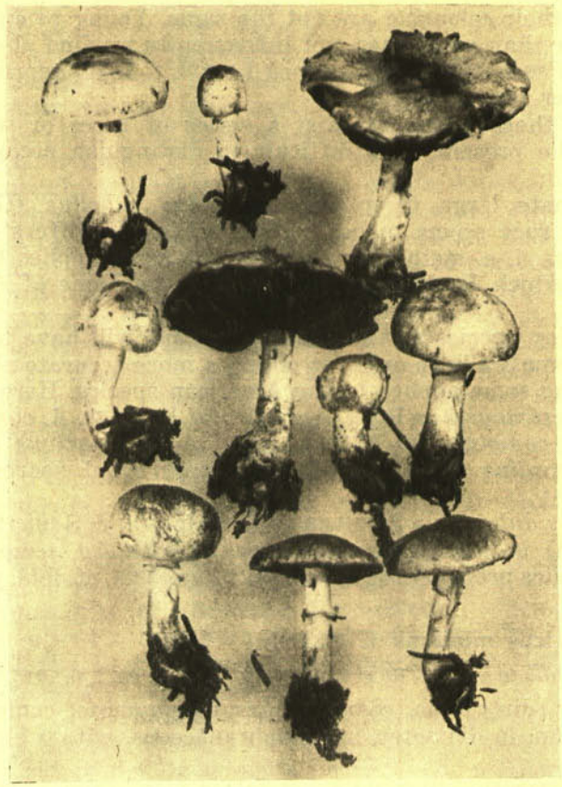

Photo A. Pilát.

Fig. 59. *Agaricus semotus* Fr.
Bohemia: Karlštejn, in Picetis solo calcareo, 15. IX. 1950, leg. A. Pilát jun. ¾ orig.

The ring is situated in about the middle of the stem and is elevated upwards, membranaceous, white, later torn and fugacious.

Gills crowded, free, first pale, soon grayish flesh-colour or impure flesh with a violet tinge, then chocolate.

Basidia tetrasporic. Cheilocystidia not prominent, clavate, 25 × 8—10 μ.

Spores short ovoid to globose ovoid, 5,5—6 × 3,5—4 μ.

Hab. In spruce forests on fallen needles, generally in crowds; in Czechoslovakia fairly abundantly distributed species. It is very abundant f. inst. in the spruce forests around Karlštejn on limestone substratum, August to October.

Very variable species in colouring as well as in size. The reddish white squamules on the pileus are not coloured immediately in youth, but colour only in the course of adolescence. Also their number and the

intensity of their colouring are not the same. Young receptacles are as a rule lighter than adult ones, not infrequently we find also pure white receptacles. *Psalliota dulcidula* sensu LANGE, t. 135C, represents f. inst. such a lighter form.

Besides there seems to exist a series of races or weak species, which for the present it is difficult to distinguish according to the literature.

I designate large receptacles *Agaricus rubellus* (GILL.) SACC., because this race seems to be fairly constant. It differs considerably by its habitus, i. e. mainly by its size. The same applies to quite tiny receptacles, which RICKEN described under the name of *Ag. minimus* (RICKEN).

These tiny species of the genus *Agaricus* will have to be further studied systematically in order to obtain a more accurate picture of the affinities. The same applies to the American species. Here belong e. g. *Agaricus micromegethus* PECK, *A. auricolor* KRIEGER, *A. comptuliformis* MURRILL. *A. comptuloides* MURRILL, and *A. diminutivus* PECK, which have all according to A. H. SMITH almost equal spores and small receptacles.

Agaricus dulcidulus SCHULZER sensu HOTSON & STUNTZ (Mycologia 30:207, 1938) is in my opinion conspecific with *Ag. semotus* FR., and the same applies probably to *Ag. diminutivus* PECK, cf. ibid. p. 206, fig. 2.

23. **Agaricus minimus** (RICKEN).

Synonymia: *Psalliota minima* RICKEN, Blätterp., p. 39, t. 62, f. 6, 1915.

P i l e u s dirty pale, coarsely hirsute-squamose, conical-campanulate, 8—10 mm. in diameter, submembranaceous, with a slightly fleshy apex.

S t e m smooth, silky, with pendulose membranaceous ring, cylindrical, 1,5—2 × 0,1—0,15 cm., tubularly hollow.

G i l l s reddish brown, crowded, ventricose, free.

S p o r e s elliptic, 5 × 3 µ, basidia 20 × 5 µ.

Hab. In copses and parks, September to October, rare. Description according to RICKEN. This fungus has not been found in Czechoslovakia. It seems to be only a small form of *Ag. semotus* FR.

24. **Agaricus subrufescens** (PECK) HOTSON & STUNTZ.

Synonymia:

Psalliota subrufescens PECK, N. Y. State Mus. Rep. 46, 1893. — KAUFFMAN, Agar. of Michigan, p, 239, t. 48—50, 1918. — LANGE Fl. Agar. Dan. 4 : 56, t. 136 B, 1939.
Psalliota perrara sensu FERDINANDSEN et WINGE, „Meddelelser" 1924, teste LANGE.
? Psalliota praenitens BECK, Verh. zool. bot. Ges. Wien, 1889, p. 611, t. XV, f. 9. — Pilz und Kräuterfreund 1921, Heft 2/3.
? Agaricus elvensis BERKELEY et BROOME, Ann. Nat. Hist. n. 1009. — COOKE, Ill. Br. F. t. 522. — MASSEE, Brit. F. Fl. 1 : 410, 1892.

Large species resembling *Agaricus augustus* FR., but with the gills in youth salmon flesh, growing in deciduous woods, mostly under oak.

Cap about 16 cm., convex, disc fulvous-bay, smooth, the rest of the

cap densely set with small adpressed, fulvous scales on a whitish ground. Gills vivid salmon flesh-colour when young. Stem about 15 cm., above the ring with a tinge of flesh-colour, below peronato-squarrose. Ring very broad, outside densely set with brownish, thick, soft scales. Flesh becoming slightly reddish with age. S p o r e s broadly ovoid, 7,5 × 5—5,5 µ. C h e i l o c y s t i d i a cylindrical, sometimes dissepimented. (Description after LANGE.)

Hab. Generally solitary in deciduous woods, especially under oak. In Denmark rare. KAUFFMAN describes in the same way this fungus from North America, from the State of Michigan, and says that it grows in tufts on accumulated decaying leaves of deciduous trees, but also on manured beds in hot-houses. It is said to be cultivated also for the market. LANGE distinguishes this species from *Ag. augustus* — but in my opinion it is not certain whether it is really different. Up till now it is known from Denmark, and if *Ag. praenitens* BECK is conspecific with it, it grows also in Austria and Bohemia. I have not seen specimens from Bohemia, and thus cannot say anything from my own experience. But KAUFFMAN's photograph cannot be distinguished from the European *Ag. augustus*. I consider it conspecific with *Ag. augustus* FR.

If *Ag. subrufescens* PECK grows in Europe in deciduous forests and *Ag. augustus* FR. only in coniferous forests, then also *Agaricus elvensis* B. et Br. must belong to *Ag. subrufescens*. According to MASSEE's description *Agaricus elvensis* B. et Br. grows in England under oak. It has gills "of a brownish flesh-colour", which agrees rather with *Ag. augustus* FR. than with *Ag. subrufescens* PECK sensu LANGE. The spores of the English fungus are according to MASSEE 8 × 4 µ, which also agrees with *Ag. augustus* FR.

According to HOTSON & STUNTZ *Agaricus subrufescens* grows abundantly at Seattle, western USA, in mixed forests. It has on the pileus brown squamules on a white background, without a yellow or straw-yellow colour. Gills white, then salmon, later reddish brown. Ring large, underside brown floccose-crusty. Spores 7,5—9 × 5—6 µ. The photograph published by the above authors in the journal Mycologia 30:224, figures receptacles which resemble weaker specimens of *Agaricus augustus* FR. (*Ag. perrarus* SCHULZER). The main difference — if of course these two species are really different — is, as HOTSON & STUNTZ write, that in life *Agaricus subrufescens* "lacks the straw-yellow colour, although it becomes yellowish when dried, and the cuticle turns yellow where bruised".

25. **Agaricus chionodermus** sp. n. (Fig. 60, Tab. III, XIV, XV, XVI.)

P i l e u s about 15 cm. in diameter, in youth subglobose or flattened at the apex, then expanded, with slightly raised centre as in Ag. arvensis, at the margin long involute, pure white, silkily shiny, only rarely slightly yellowish brownish, silkily radially fibrillose, to touch as if slightly moist, and cracking already in youth into non-prominent, thin, very fine, but large, adhering fibrillose, white scales, which are concolore with the background, and almost disappear when the pileus dries, as

they are adpressed and adhering to the background. The number of scales is in youth smaller than later on, though also the mature, plane pileus has not many scales. The cuticle peels perfectly to the apex and is pure white, also when scratched, and turns yellow, only withering after many hours.

S t e m relatively long and strikingly deeply sunk into the soil, 6—12 cm. × 1,5—2,5 cm., pure white, cylindrical, below not thickened into a bulb, only sometimes in the lower half a little thicker than in the upper half, at the base ending unthickened and rounded or fusiform attenuated, never thickened in a sharply marked-off bulb, and in its lowest part sometimes 24 hours after being torn off turning yellow, more rarely already in nature yellowish inside, covered in its whole length with adpressed, irregular, white scales, which are sometimes a little distant, and which are arranged in irregular rows so that the stem can even be circularly spotted, fairly firmly fleshy, tougher and more compact and in maturity less hollow than in Ag. arvensis.

R i n g double, rather stately, in its lower part torn into irregular, coarse, dented tatters, which are sometimes yellowish at the tip, otherwise the whole receptacle is persistently white.

F l e s h pure white, only in the lower part of the stem inside a little yellowish, not turning yellow where bruised, scratched or cut, and only after 24 hours a yellow colouring generally appears; without smell or smell not pronounced, but not of anise as in Ag. arvensis, taste not pronounced. — Good edible fungus.

G i l l s in earliest youth whitish, soon and long until maturity vividly rosy, almost as in *Ag. silvaticus* or *xanthodermus*, later reddish brown to black, crowded and free.

B a s i d i a tetrasporic, 27 × 8—10 µ.

C h e i l o c y s t i d i a on the edge pyriform-clavate, not prominent, sparse, little different from the basidia, 15 × 9 µ, later fugacious.

S p o r e s ellipsoid-amygdaloid, with slightly oblique apicule, 8,5—10 (10,5) × 4,8—6 µ.

Hab. In pure, high spruce forest on a limestone substratum at Karlštejn unfar "Královská studánka" in several places; 27. 7. 1950, 3. 8. 1950, 12. 8. 1950, and 20. 8. 1950. Always in the same habitus and in numerous specimens. On the margin of a deciduous wood Dr. MILOŠ DEYL collected under *Aesculus hippocastanum* at Velký Osek, 21. IX. 1950, two young receptacles (spores amygdaloid-ellipsoid, 9,2 × 5,5 µ, cheilocystidia 13 × 22 µ. Gills of young receptacles in bud roseate. The pileus became only the next day slightly yellowish where bruised. In the first three finds I always found 15—20 specimens. This species resembles in its habitus and size strikingly *Ag. arvensis*, but with a more detailed investigation it is seen to differ from it by the large, flat, though little prominent scales on the pileus and stem, further by the stem being deeply sunk into the soil and not thickened below, with a permanently pure white flesh, which does not turn yellow when scratched either in the stem or in the pileus (a yellow coloration appears only after a long time), further by the gills being in a half-mature state vividly salmon rose (often rose already in youth). The cuticle

Photo A. Pilát.

Fig. 60. *Agaricus chionodermus* PILÁT.
Bohemia: Velký Osek, ad silvae frondosae marginem sub Aesculo hippocastano, 20. IX. 1950, leg. Dr. Miloš Deyl. 1/1 orig. Specimina iuvenilia.

when fresh gives a moist impression, though it is neither mucous nor sticky. Also the smell of anise is lacking, which is very characteristic for Ag. arvensis. The stem is also more compact and in maturity less hollow than in Ag. arvensis.

Because of its striking resemblance to this fungus this species has been overlooked up till now, though mushroom-gatherers collected it for eating in the above-mentioned forest already for many years, taking it to be Ag. arvensis.

Of the American species *Agaricus albolutescens* ZELLER (Mycologia 30 : 468, 1938, Smith, Pap. Michig. Acad. 25 : 119, 1939) seems to be the most closely related; it has a white pileus, then entirely light orange yellow, apparently mucous. Spores much smaller than in our fungus, 6—6,5 × 3,5—4 µ.

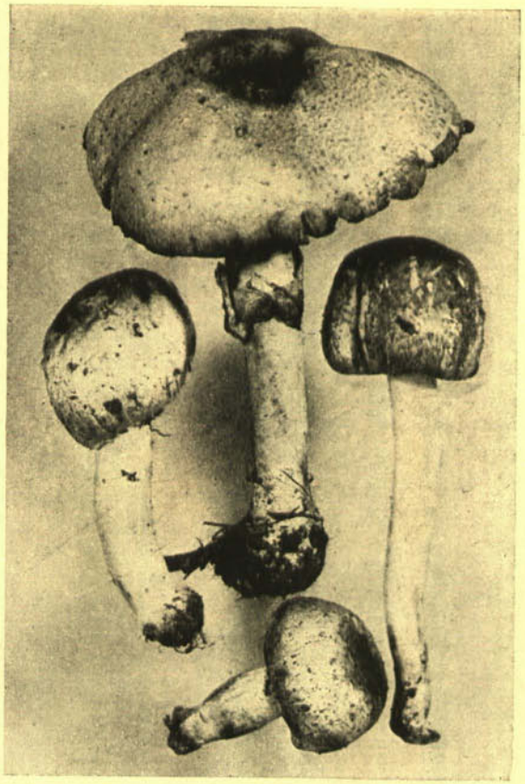

Photo A. Pilát.

Fig. 61. *Agaricus meleagris* J. SCHAEFFER.
Bohemia: Velký Osek, in silva frondosa uda, 21. IX. 1950,
leg. Dr. M. Deyl. ¾ orig.

26. **Agaricus meleagris** J. SCHAEFFER 1925. (Fig. 61—68, Tab. XVII.)

?? Agaricus placomyces PECK, N. York State Mus. Rep. 29, 1878.

The receptacles resemble in size and habitus Ag. silvaticus Schaeff., only sometimes they are a little more stately. Pileus 8—11 cm. in diameter, with the margin in youth long involute, globose-glandiform or obtusely globose, flattened above, then obtusely hemispherical-convex to expanded, at the apex later generally more or less flat, so that the convex parts of the pileus set in at the flat apex almost with an edge, in youth ochraceous grayish brown to smoky blackish, or also clayey brown, soon cracking into adpressed, imbricate, fibrillose and more or less regularly concentrically arranged, turbidly dark brown and smoky blackish or ochraceous grayish brown scales on a white, whitish and dirty ivory background, at the apex permanently brown to smoky

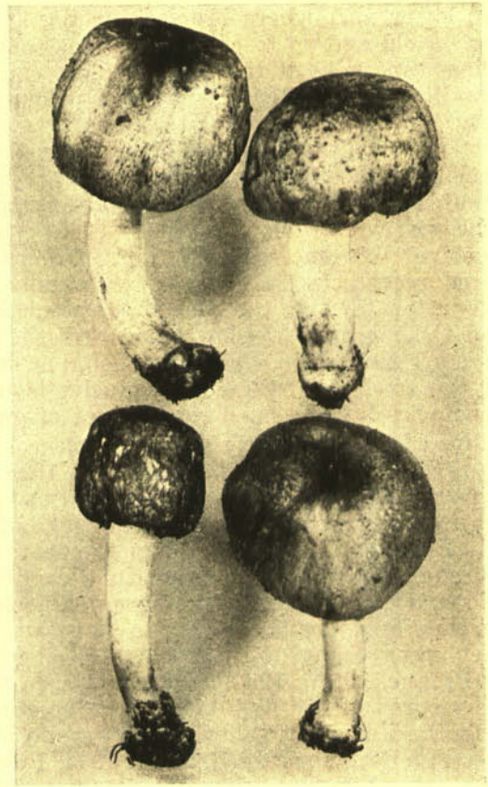

Photo A. Pilat.

Fig. 62. *Agaricus meleagris* J. SCHAEFFER.
Bohemia: Velký Osek, in silva frondosa uda, 21. IX. 1950,
leg. Dr. M. Deyl. ¾ orig.

blackish, smooth and not cracked. Where bruised the pileus turns finally brownish.

Gills up to 8 mm. broad, free, in maturity remote from the stem, in youth almost white, then beautifully rose, withered grayish brown with a rose tinge, then pale reddish chocolate to black, crowded.

Ring thinly membranaceous, powerful and long closing the underside of the pileus, later below slightly yellowish to brownish, above in youth white, flaccid, indistinctly double, then shirt-like pendulose or even adhering to the stem.

Stem cylindrical, relatively thin, towards the base generally slightly clavate-thickened and at the base even with a sharply marked-off flat bulb, at the base often bent, 6—11 cm. long and 10—13 mm. thick (at the base of the bulb up to 20 mm.), first entirely pure white and silkily shiny, glabrose and smooth, then generally in the upper part

white and in the lower part where bruised turning spotted brown or tarnishing brown, in old age up to grayish brown, hollow from youth, when cut colouring, especially at the base of the stem, yellow (in the Prague specimens little) and after a while the yellow places turn red and then are rusty.

F l e s h first pure white and silky, becoming yellow when cut in some places, especially in the pileus and still more in the base of the stem. After about 5 minutes the yellow coloration begins to turn brick-red until finally it turns brown; with KOH flesh and cuticle of the pileus turn rapidly and intensively chrome yellow orange. Otherwise the cut of older and withered receptacles is dirty white, pinkish. Sometimes it turns a very little yellow towards the base of the stem. Also the margin of the pileus and the ring turn yellow when bruised. In old age the whole receptacle is spotted brown. Taste sweetish, but on the whole not pronounced, and the smell of withered receptacles is not pronounced. Fresh young receptacles have a smell reminiscent of gallnut ink.

S p o r e s ellipsoid, with slightly obliquely placed apicule, 5,8—6 (7) × 3,5—4,2 µ. In his original diagnosis of 1925 J. SCHAEFFER measured the spores as 4—5 × 3 µ. C h e i l o c y s t i d i a globose-pyriform, 10—20 µ thick, fairly abundant on the edge of the gills.

In Prague — Kinský Park — this fungus appears every year. In 1950 Mr. BENDA brought me from there beautiful specimens. He collected them 21. V. 1950 and 17. IX. 1950. The Prague specimens have the scales on the pileus brown and belong to the var. *perdicinus* m. (SCHAEFFER's "Rebhuhnegerling"). Dr. ŠINDELKA collected this species at Jiloviště near Prague, 29. V. 1950. I have not seen the receptacles. According to the records of Mr. I. CHARVÁT the spores were 5,5—6,5 (7) × 3,5—4 µ. In the Zahořany valley unfar Prague Mr. ZOUL found several receptacles in a deciduous wood, 2. VI. 1944. I did not see these receptacles either, and therefore cite Mr. I. Charvát's record, who studied them: Pileus 8—11 cm. in diameter, obtusely globose or hemispherical, then expanded, without tubercle, dirty ivory with fine, crowded, dark brown squamules, in the centre brown and smooth. Gills crowded, not broad. Stem 10 × 1,2 cm., whitish, with a rather small bulb at the base, bent and at the base always bent in. Flesh white, turning immediately lemon yellow when cut, more in the base of the stem. Taste delicious, reminiscent of hazel-nuts, smell not pronounced, scarcely perceptible. Cuticle and flesh of the pileus and stem react with NaOH immediately lemon yellow. Spores 5—5,5 × 3,5 µ. Cut and dried slivers of the fungus smells pleasantly fungous. Mrs. FR. KODL found in the Šárka valley near Prague, 10. VIII. 1944, nice receptacles. I give here two photographs taken by Mr. I. CHARVÁT. The latter remarked on the living receptacles: Receptacle not smelling of anise. In cutting the stem flesh white, without unpleasant smell, tarnishing light ochraceous. Colour of the pileus light chocolate. Spores 5—5,5 × 3,5 µ.

Unfortunately I saw at first only the specimens mentioned above, found in Prague in the Kinský Park. They were painted by Mr. OTTO UŠÁK, and his water-colour is deposited in the collections of the Botanical Division of the National Museum.

Photo A. Pilát.

Fig. 63. *Agaricus meleagris* J. SCHAEFF. var. *perdicinus* PILÁT.
Bohemia: Praha-Kinského zahrada, 15. IX. 1950. 4/5 orig. Specimina iuvenilia.
Leg. Ing. Benda.

Dried specimens are reminiscent of *Agaricus silvaticus* SCHAEFFER, but they have a much lighter, less reddish rusty pileus. Living it is distinguished from silvaticus by the flesh becoming immediately yellow, especially in the stem, otherwise it much resembles this species. BRESADOLA confused this fungus with *Ag. silvaticus*, and his figuring in Iconographia Mycologica, t. 830, represents *Ag. meleagris* SCHAEFFER.

Only on 21. IX. 1950 and again on 29. IX. 1950 Dr. M. DEYL brought me from the moist deciduous woods at Velký Osek a great number of receptacles, which correspond accurately to the typical form which J. SCHAEFFER described for the first time as t y p i c a l *Agaricus meleagris*. I recorded the following description:

P i l e u s 6—8 cm., thin fleshy, in youth subglobose, but angular, with a flat apex, then convex with an apex which is as if truncate to in the centre depressed, but above the tip of the stem often with a small

Photo A. Pilát.

Fig. 64. *Agaricus meleagris* J. SCHAEFF. var. *perdicinus* PILÁT.
Bohemia: Praha-Kinského zahrada, 15. IX. 1950. 1/1 orig. Specimen adultum.
Leg. Ing. Benda.

tubercle, thin fleshy, at the apex and in youth entirely sooty blackish brown, at the apex and outside the apex somethimes beset with larger, blackish brown squamules, which are perhaps from the velum universale, otherwise finely floccose and equally brownish black squamose on a white background, at the margin long involute.

S t e m relatively thin, cylindrical, truncate at the base and usually enlarged in a sharply marked-off bulb, 5—7 cm. long, 0,7—1,2 cm. (at the base up to 1,5 cm.) thick, pure white, silky, glabrose, silkily shiny, almost not turning yellow, only in the basal bulb later almost orange-yellow, in the lower part of the stem on the surface later often rusty. Ring double, below coarsely floccose — crusty and later yellowish or rusty, on the upper side smooth or slightly furrowed, white. G i l l s long white, then flesh pink, finally chocolate to black. F l e s h white, little or not at all turning yellow in the air, rather colouring rusty, after

Photo A. Pilát.

Fig. 65. *Agaricus meleagris* J. SCHAEFF. var. *perdicinus* PILÁT.
Bohemia: Praha-Kinského zahrada, 15. IX. 1950. 1/1 orig. Specimen adultum.
Leg. Ing. Benda.

KOH rapidly colouring orange-yellow. C h e i l o c y s t i d i a globose-ellipsoid to globose, about 13 µ thick. S p o r e s ovoid-ellipsoid, 4,5—5 (5,5) × 3,6 µ, with a fat drop, relatively pale couloured. B a s i d i a tetrasporic, 5,5 × 20 µ.

JULIUS SCHAEFFER, who described this species, places it in his later contribution in MICHAEL-HENNIG-SCHAEFFER: Führer für Pilzfreunde as subspecies to *Agaricus xanthodermus* GENEV; this is wrong. The two species differ considerably and do n o t resemble each other even macroscopically. Only the bad smell of fresh receptacles is sometimes similar. *Agaricus meleagris* J. SCHAEFFER is certainly a separate and well defined species, even though the colour of the pileus in youth and later the colour of the scales on the pileus sometimes change from blackish to brown. It grows also in other places than *Ag. xanthodermus;* the latter seems to be more xerophile. The two species never pass into each other.

Around Karlštejn, where I examined for several years many thousands of receptacles of *Agaricus xanthodermus* GENEV. in all stages of development and under all ecological and meteorological conditions, it never produced forms which would be even slightly reminiscent of *Agaricus meleagris* SCHAEFFER. *Agaricus xanthodermus* f. *obscurata* MAIRE or f. *lepiotoides* MAIRE (which by the way is one and the same) is something quite different and unsimilar. J. SCHAEFFER was misled to combining the two species only by their similar smell (the turning yellow of the flesh is in the two species rather different). J. SCHAEFFER, who had a very good sense of smell, therefore in my opinion slightly overrated the systematic importance of the smell. The smell is within certain limits rather variable, just like the other characters.

In Bohemia *Agaricus meleagris* J. SCHAEFFER is very rare and overlooked — apparently because of its considerable resemblance to *Agaricus silvaticus* SCHAEFF. I saw living receptacles only from three localities in Bohemia. So far I have not yet collected it in the field.

Quality of the receptacles: According to J. SCHAEFFER the receptacles smell in youth and when fresh like gallnut ink. The receptacles which he prepared for eating tasted bad, of turpentine or carbolic acid and produced a slight poisoning. Thus this species is not edible.

According to J. SCHAEFFER it occurs in two forms, one of them with blackish gray or smoke brown scales on a white background he calls "Perlhuhnchampignon" (var. *typicus* m.), and the other with clayey brown scales he calls "Rebhuhnchampignon" (var. *perdicinus* m.). Both forms often grow together and pass into each other, at least J. SCHAEFFER maintains this. The receptacles growing in the Kinský Park in Prague had always brown squamules on the pileus, (var. *perdicinus)*. But all the receptacles which Dr. DEYL collected in great quantities in the moist deciduous woods at Velký Osek had smoke blackish or blackish brown squamules, and thus represented the typical species which J. SCHAEFFER called "Perlhuhnegerling".

From the dark coloured and squamosely cracked forms of *Agaricus xanthodermus Genev.* (f. *obscurata* MAIRE or *lepiotoides* MAIRE), which sometimes smells badly like *Agaricus meleagris* J. SCHAEFF., the latter is distinguished by its receptacles being dark coloured already in youth, even when they grow in the shade. They are grayish blackish or brown and cracked into small, adpressed, fibrillose and more or less regularly concentrically arranged squamules. Older receptacles are rather lighter, because the dark coloured cuticle in cracking into squamules uncovers around the squamules the white flesh below. In quite old receptacles the scales may even disappear, and their pileus is then almost white.

On the contrary young and mature receptacles of *Agaricus xanthodermus* GENEV., when growing in the shade, are pure white. Only specimens exposed to direct sunlight colour on the pileus turbidly gray or grayish brown and crack areolately, i. e. radially and concentrically. The irregular squamules thus formed are coarse, distant, irregularly arranged and areolate. When only one side of the pileus

is exposed to sunlight, the pileus colours only on the exposed side, and the other side remains white and uncracked. Only explosed pilei colour dark and crack, young ones as well as mature ones. The older the exposed receptacle is the darker and the more and more deeply cracked it is.

Conspecific with *Agaricus meleagris* J. SCHAEFF. seems to be *Agaricus placomyces* PECK, N. Y. State Mus. Rep. 29, 1878, KAUFFMAN, The Agaricaceae of Michigan, p. 238, 1918. I saw a photograph of this American species in the work of A. H. SMITH: The genus Agaricus, Pap. Michigan Acad. 25 : 125, t. IX. 1940. The American fungus has the spores 4,5—5,5 × 3,5—4 µ, which is slightly less than in *A. meleagris.* The American receptacles in the photograph of SMITH have a relatively thicker stem than the European *Agaricus meleagris* has normally, i. e. as I have seen it in Bohemian species and as J. SCHAEFFER paints it according to specimens found near Berlin. A good photograph of *Agaricus placomyces* PECK is given also in the work of HOBSON & STUNTZ: The genus Agaricus in Western Washington, Mycologia 30 : 221, fig. 6, 1938, which was made from receptacles collected in the State of Washington. It represents a fungus corresponding entirely to the one figured by A. H. SMITH. Also in this case the mature specimens have a rather thick stem and seem to be also bigger than the European *Ag. meleagris* J. SCHAEFF., for according to the report of the above authors the pileus is 8—15 cm. in diameter. Spores 4,5—6 × 3—3,5 µ. Should the European *Ag. meleagris* J. SCHAEFF. and the American *Ag. placomyces* PECK be conspecific, PECK'S designation would of course have priority.

A. H. SMITH (Pap. Mich. Ac. 25: 125, 1940) describes also a new *Agaricus placomyces* var. *microsporus* SMITH, with a pileus 3—5 cm., sooty fibrillose, in the centre blackish brown. Stem turning red when scratched, and flesh in the fracture pinkish; without smell. Spores 4—5 × 2,5—3 µ. It was found at Smith River in California, 16. XI. 1937.

As deviating form seems to belong to *Agaricus placomyces* PECK (according to A. H. SMITH) *Agaricus approximans* PECK. It differs by its pileus being provided with a tubercle and by the gills not being salmon coloured. To this species belongs as form probably also *Agaricus pocillator* MURRILL.

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Adnotatio. In proximam affinitatem Agarici meleagris J. Schaeffer etiam fungus, quem J. Velenovský sub nomine *Psalliotae nigricantis*

Photo A. Pilát.

Fig. 66. *Agaricus meleagris* J. SCHAEFFER var. *nigricans* (VEL.) PILÁT.
Bohemia: Praha-Střešovice, ad terram graminosam in finibus agri sub Rosa canina in societate Festucae sulcatae, Lolii perennis, Tritici repentis etc., 6. IX. 1934, leg. Dr. J. Herink. 1/1 orig.

VEL. ad exemplaria adulta, a virgine Šafaříková augusto 1950 prope Veltrusy, Bohemiae, loco graminoso lecta descripsit. Haec varietas locis graminosis, subsiccis occurit et habitu a typo paulisper discrepat:

Agaricus meleagris var. **nigricans** (VEL.) PILÁT. — (Fig. 66—68.)

Syn.: *Psalliota nigricans* VELENOVSKÝ, České houby p. 574, fig. 80, 1921. — *Velenovskýi Species Novae Basidiomycetum*, p. 217, 1948.

Syn.: *Psalliota nigricans* VELENOVSKÝ, České houby p. 574, fig. 80, 1921. — Velenovskýi Species Novae Basidiomycetum, p. 217, 1948.

Minor, pileo 4—6 cm. diam., tenuiter carnoso, mox explanato, subumbonato, primum centro ochraceo-luteo, marginem versus albido, levi,

Photo A. Pilát.

Fig. 67. *Agaricus meleagris* J. SCHAEFFER var. *nigricans* (VEL.) PILÁT.
Bohemia: Praha-Střešovice, ad terram graminosam in finibus agri sub Rosa canina in societate Festucae sulcatae, Lolii perennis, Tritici repentis etc., 6. IX. 1934, leg. Dr. J. Herink. 1/1 orig.

mox ad substratum album obscure squamoso vel fibrilloso-squamoso, centro obscuro, subnigricanti, margine tenui, vulnerato apulisper laete lutescenti.

Lamellae mox obscure colorate, chocolateae tinctu purpuraceo, confertae, tenues, liberae.

Stipes tenuis, ca 8 cm longus, apice 4 mm, centro 7 mm crassus, basi paulisper clavato-incrassatus, sericeus, albus vel albidus, praecipue dimidio inferiori tactu vel aetate sublutescens, apice dein tinctu violaceo, centro fibrilloso-farctus, tinctu pallide lutescenti. Annulus tenuis, dein subevanidus. Caro pilei alba, odore subaniseo.

Sporae breviter ovoideae, 5—6 × 3,3—3,7 μ.

8*

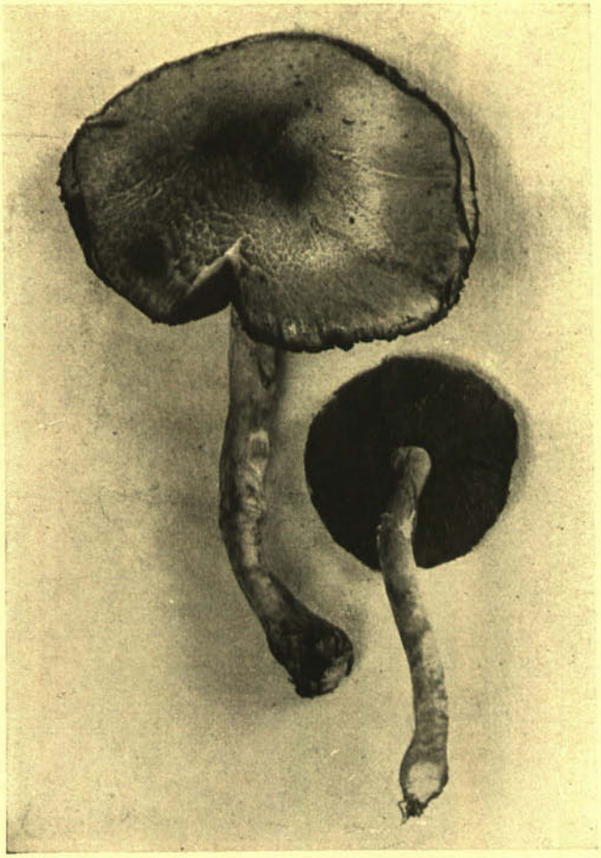

Photo A. Pilát.

Fig. 68. *Agaricus meleagris* J. SCHAEFFER var. *nigricans* (VEL.) PILÁT.
Bohemia: Praha-Střešovice, ad terram graminosam in finibus agri sub Rosa canina in societate Festucae sulcatae, Lolii perennis, Tritici repentis etc., 6. IX. 1934, leg. Dr. J. Herink. 1/1 orig. ¾ orig.

Ad fines agrorum sub Rosa canina loco graminoso in societate Festucae sulcatae, Tritici repentis, Lolii perennis et Crepidis biennis prope Praha XVIII-Střešovice, 6. IX. 1934 Dr. J. Herink legit. — Prope Veltrusy loco graminoso (VIII. 1950, Šafaříková leg.).

27. **Agaricus xanthodermus** GENEVIER 1876. (Fig. 69—74.)

Synonymia:

Psalliota xanthoderma RICHON et ROZE 1886.
Pratella cretacea QUÉLET 1887 et var. *flavescens* QUÉL.
Agaricus arvensis CORDIER 1826, non aliorum.
Pratella campestris var. *silvicola* GILLET (non VITT, nec FR. nec aliorum).

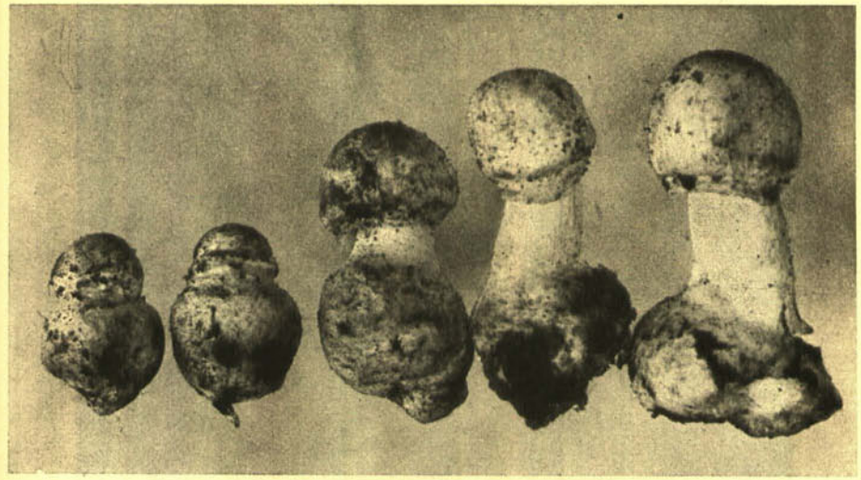

Photo A. Pilát.

Fig. 69. *Agaricus xanthodermus* GENEV.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950. Specimina iuvenilia. 1/1 orig. A. Pilát legit.

Agaricus edulis BULL. 1790 p. p. teste KONRAD et MAUBLANC, ROQUES, KROMBHOLZ, p. p.
Psalliota flavescens QUÉLET 1888 (non GILLET). — SINGER, Zeitschr. f. Pilzkunde, 1 : 23, 1922.
Pratella flavescens RICHON et ROZE.
Agaricus iodoformicus SPEGAZZINI, teste MAIRE.
Psalliota chrysopus G. BECK, Pilz und Käuterfreund 5, fasc. 2—3, p. 45, 1921. — SINGER, Zeitschr. f. Pilzk. 1 : 24, 1922.
Psalliota foetens SMOTLACHA, Čas. čs. houbařů, 2 : 70, 1920.
Psalliota pseudoarvensis PASSECKER, Zeitschr. f. Pilzkunde 16 : 36—39, 1932.

Literature: PASSECKER, Zeitschr. f. Pilzkunde 14 : 60—62. — SCHAEFFER ibid. 11 : 68—75, 1932. — SOEHNER, ibid. 10 : 75—79, 99—103, 1931. — MOESZ G. in Természettudományi Közlöny 1933 évi július 1—15, számából.

This species occurs in a truly amazing quantity in the spruce forests at Karlštejn in Central Bohemia on a limestone substratum (Devonian limestones). It grows almost always in large crowds, most frequently where more light penetrates to the ground; in dense spruce forests it is rarer. Often we find heaps counting several hundred receptacles, even forming parts of fairy rings. It occurs together with *Agaricus arvensis* (exquisitus Vitt.) with which it is often confused. Of course also other species of mushrooms grow in these forests, as e. g. *Ag. augustus, Ag. silvaticus, Ag. haemorrhoidarius, Ag. semotus, Ag. Beneši, Ag. Caroli, Ag. chionodermus* etc. Quite apart from the other criteria in which *Ag. xanthodermus* differs from *Ag. arvensis* (exquisitus), we distinguish these two species easily by the fact that the receptacles of *Ag. xanthodermus* are on the whole shallowly and strikingly loosely rooted in the soil being attached to the humus by distinct, white

Photo A. Pilát.

Fig. 70. *Agaricus xanthodermus* GENEV.
Bohemia: Karlštejn, in Picetis solo calcareo, 15. IX. 1950. Specimina iuvenilia in caespite. 1/1 orig. A. Pilát legit.

mycelian cords, so that they can be easily taken out of the soil without damaging them, while *Ag. arvensis* is grown into the soil very firmly and the lower part of the stem is more deeply sunk into the humus. The young receptacles of *Ag. xanthodermus* are pure white and, when not exposed to direct sunlight, they remain white to maturity. The receptacles of *Ag. arvensis* have also in youth a slight yellowish tinge, often only a very slight one it is true, but nevertheless their pileus is by far not so pure white as in *Ag. xanthodermus*. When of course the receptacles are exposed directly to the sun and especially in sunny, rather dry weather the illuminated part of the pileus of *Ag. xanthodermus* begins to colour gray, turbidly grayish brown to dark grayish brown, and at the same time it cracks, first radially and then transversally, so that areolate squamules are formed, which are generally large, rough and irregular, often also elevated, grayish brown and contrasting strongly with the white flesh of the pileus which shows in the cracks. Often only the apex of the pileus cracks, or only one side where it is illuminated by the sun from the side. In these forms, which

Photo A. Pilát.

Fig. 71. *Agaricus xanthodermus* GENEV.
Bohemia: Karlštejn, in Picetis solo calcareo, 15. IX. 1950. Specimina iuvenilia in caespite. 1/1 orig. A. Pilát legit.

MAIRE designated as varietas *obscurata* 1910, and which are scarcely distinguished from var. *lepiotoides* MAIRE, which he described in 1908 (B. S. M. 24 : p. LVIII 1908, and BSM 26 : 192, 1910), the gills are in the semi-mature state generally not rose but grayish purple and then brownish purple to black and lower than in the other species of the genus *Agaricus* as these receptacles grown in the sun are partly dried out. In *Ag. xanthodermus* the gills are in the semi-mature state generally beautifully rosy, approximately as in *Ag. silvaticus* and *A. haemorrhoidarius*, while they are never rosy in *Ag. arvensis*.

JULIUS SCHAEFFER places to *Ag. xanthodermus* as subsp. *meleagris* J. SCHAEFFER, which is figured in colours in MICHAEL-HENNIG-SCHAEFFER: Führer für Pilzfreunde, t. 58. Though it is related to *Ag. xanthodermus* GENEV., it is specifically different from it, so that I consider it a good separate species. At Karlštejn, where *Ag. xanthodermus* grows in

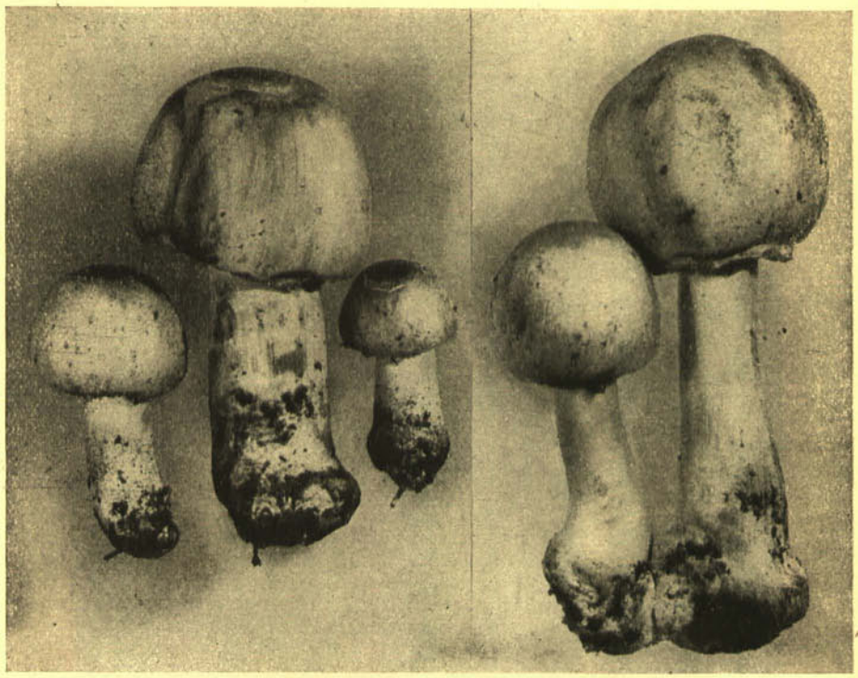

Photo A. Pilát.

Fig. 72. *Agaricus xanthodermus* GENEV.
Bohemia: Karlštejn, in Picetis solo calcareo, 4. IX. 1950 et 9. VIII. 1950, A. Pilát legit. Specimina iuvenilia et semiadulta. ½ orig.

amazing masses, I never found a transition to *Ag. meleagris* J. SCHAEFFER.

Description of *Ag. xanthodermus* according to the specimens from Karlštejn:

P i l e u s in youth subglobose and only quite slightly truncate, later hemispherical-convex, then expanded and up to 12(14) cm. in diameter, in maturity almost not distinguished in shape from Ag. arvensis, but it is so in youth, as it is subglobose and in Ag. arvensis it is only subellipsoid and truncated. Surface of the pileus silkily smooth, rarely slightly squamose, pure white or whitish or grayish, but not yellowish, colouring when living while juicy fairly rapidly and rather vividly yellow to yellow with an orange tinge when scratched. This yellow colouring is very fugaceous and leaves behind dirty brown spots. The surface of the pileus is smooth, but has a tendency to tear radially. In places illuminated by the sun it often colours grayish brown and cracks deeply areolate-squamose.

G i l l s crowded, free, then remote from the stem, rather narrower than in other species, attenuated at both ends, whitish in youth, then in stately half-grown specimens vividly rosy flesh coloured. The rosy

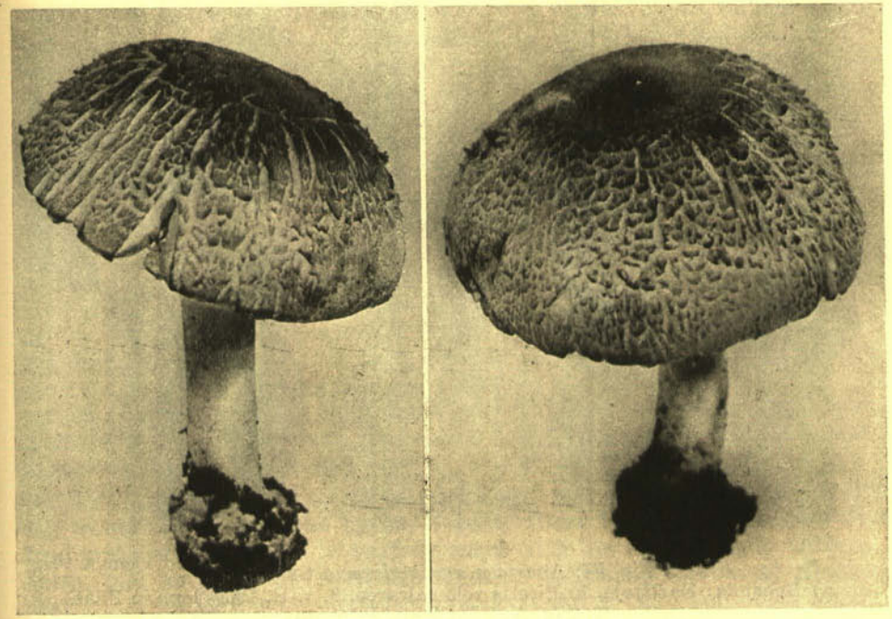

Photo A. Pilát.

Fig. 73. *Agaricus xanthodermus* GENEV.
Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. A. Pilát. Specimina adulta, insolata, qua de causa pileo squamoso-diffracto. ½ orig.

coloration disappears however soon, in dry weather it does not develop at all, and turns into reddish chocolate to brownish purple and black.

S t e m fairly long and slim, pure white, glabrose and silkily shiny, at the base generally thickened into a sharply marked-off and generally more or less distinctly bordered bulb, which is not so flat on the underside as in Ag. arvensis, but is sometimes larger, especially in youth. This basal bulb colours specially intensively vividly yellow to orange when scratched. In dried specimens this reaction is little pronounced, and in both cases the yellow colouring soon disappears. Above the bulb the stem reacts to scratching also by turning yellow, but less intensively. When bruised the stem after turning yellow soon colours dirty rusty. The stem is inside in youth silkily filled, then hollow.

R i n g white, broad, almost simple, thickened at the margin and here sometimes turning yellow, rather thickly membranaceous and almost bifid, below subsquamose, peelable along the stem upwards.

F l e s h white, when cut rapidly turning yellow, especially in the bulb of the stem, but the yellow colour rapidly fades and turns dirty, turning into grayish rusty, taste moderate, fungous, smell slight, perhaps a little unpleasant, especially marked in cooking. Sporee brownish purple.

S p o r e s pale brownish red, lighter than in the other species of

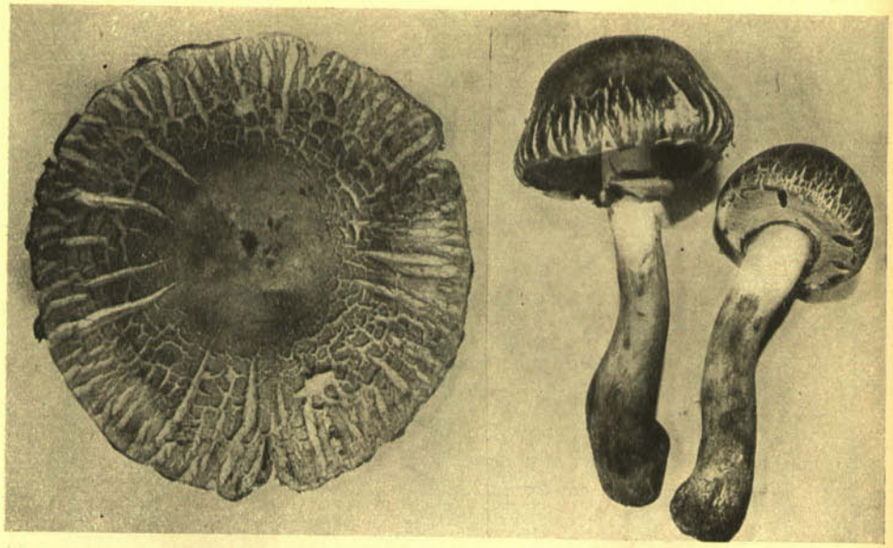

Fig. 74. *Agaricus xanthodermus* GENEV. Photo A. Pilát.
a) Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. A. Pilát. ½ orig. A. Pilát legit. et photo.

b) Bohemia: Praha, Karlovo náměstí, in hoto publico, 20. VIII. 1943, leg. Ant. Konrád. ½ orig. Ivan Charvát photo.

the genus Agaricus, ellipsoid-ovoid, 6—6,8(7,2) × 4—5,5 µ. (The measurement of the spores according to KONRAD and MANBLANC: 6—8 × 3,5—4,5 µ, according to J. SCHAEFFER 5—6(7) × 3—4 µ.)

The description given above refers to the specimens growing in masses in the spruce forests at Karlštejn unfar Prague. This fungus grows here only in spruce forests, and though the spruce forests form only small islands in the large deciduous forests I have never found it in these. This *Ag. xanthodermus* of Karlštejn differs perhaps from the forms of this species which grow in parks or deciduous woods. First of all the Karlštejn fungus has when alive a hardly perceptible bad smell and in cooking only a slight one, and it cannot be said that this smell though slightly umpleasant is reminiscent of carbolic acid, cresol or chlorine. Perhaps a slight smell of gallnut ink, to which J. SCHAEFFER compares it, would correspond best to the smell of this Karlštejn fungus when fresh. Of course I have never observed in the Karlštejn fungus the strong smell of carbolic acid which the forms from deciduous forests are said to emit in cooking as described in literature. For years I have collected this Karlštejn fungus of the spruce forests, and in our family we have eaten tens of killogrammes of it without any ill effects. Also other people gather it in this area, and I have never heard that it could cause stomach trouble. Fresh it is almost without smell, in cooking it smells slightly, but it tastes very well when one adds vinegar or salt

water to it after pouring off the water in which it was boiled. Many people gather it unknown to themselves as it grows together with *Ag. arvensis* which it resembles greatly. In this respect the Karlštejn fungus of the spruce forests thus differs from *Ag. xanthodermus* of the deciduous forests, at least according to the reports in the literature. Unfortunately I have not collected this species or form of the deciduous forests, which in cooking smells strongly of carbolic acid, and thus I cannot establish the differences. Macroscopically the Karlštejn fungus corresponds very well to the description by KONRAD & MAUBLANC and by J. SCHAEFFER. Therefore it seems to me that there exists a race growing mainly in deciduous forests and parks which differs from the Karlštejn fungus by having a repulsive smell of carbolic acid in cooking and perhaps also by a more intensive turning yellow of the base of the stem. This fungus is usually designated as poisonous as shown by remarks in the literature and by its German name "Giftegerling". It causes stomach troubles and slight poisonings, which often have been described in the literature. It is not deadly poisonous, but very disagreeable for some persons.

Dr. MILOŠ DEYL, who collected many times with me the Karlštejn *Ag. xanthodermus* in the spruce forests there in great quantities for food and ate it prepared in various ways with his whole family without harm, told me that he found the form of deciduous forests at Hlasice near Nový Bydžov, where it grows ewery year in the flood-plain woods *(Quercus robur, Fraxinus excelsior, Alnus incana, Ulmus effusa,* etc.). This form which seems to correspond to the type described as *Ag. xanthodermus* has perhaps the stem slightly shorter and turns more yellow. Dr. DEYL cooked it once for food. When boiling the fungus smelled repulsively and the family refused to eat it; so he ate it alone. After eating it he began to vomit and got rather intensive stomach trouble, and was left for long with an aversion to all mushrooms.

Unfortunately I myself do not know this carbolic smelling form of deciduous forest, and thus it is not clear to me whether the Karlštejn fungus of spruce forests is really conspecific with the fungus of deciduous forests or not.

SOEHNER (Münchner Karbolheidechampignon, Zeitschr. f. Pilzkunde, 10 : 75, 1931) described a fungus which is evidently conspecific with *Agaricus xanthodermus* GENEV. He writes that it grows at Munich outside the forest in a pasture and also in the adjoining pine forest among the grass, often in fairy rings, as this fungus does often also in Czechoslovakia.

F. PASSECKER (in Zeitschr. f. Pilzkunde, 14 : 60—62, 1930) writes that the inhabitants cultivate this fungus also artificially at Rosenberg in the Kemptal in Lower Austria. When they gather the receptacles for the kitchen they cut off the lower part of the stems and plant them in the gardens. The mycelium is said to take root, and in the following years receptacles appear. PASSECKER, who cultivated the mycelium of this fungus in artificial culture, writes that the mycelium smells of carbolic acid. In the Kemptal this fungus is abundant enough.

It is a dry region with annual precipitations below 500 mm. and the soil is poor in lime. The inhabitants collect it and eat it without any bad effects.

28. **Agaricus rusiophyllus** LASCH. 1828.

Synonymia:

Agaricus comtulus FRIES 1837. — *Psalliota comtula* QUÉL. 1872. — VELENOVSKÝ 1921, 1939. — BRESODOLA, Ic. Myc. t. 833. — *Pratella comtula* GILLET 1878.
Psalliota sagata sensu VELENOVSKÝ 1921 ex VELENOVSKÝ, Novitates Mycologicae p. 154.
Psalliota minuta VELENOVSKÝ, České houby p. 564, 1921 ex VELENOVSKÝ, Novitates Mycologicae 154, 1939.
Psalliota xerophila VELENOVSKÝ, České houby, 566, 1921.
? *Psalliota exanullata* VELENOVSKÝ, České houby p. 565, 1921. — VELENOVSKÝi Spec. Nov. Bas. p. 217, 1948.
Psalliota rosea VELENOVSKÝ, Novitates Mycolog. p. 155, 1939.
? *Psalliota depressa* VELENOVSKÝ, Novit. Mycol. Novis. p. 83, 1947.
? *Psalliota dulcidula* sensu JUL. SCHAEFFER, Ann. Mycol. 36 : 80, 1938.

Pileus 2,5—3,5 cm. in diameter, strongly convex, almost white, then slightly yellowish, especially in the middle, often with a flesh tinge, in the middle more saturated coloured, non-squamose or only slightly so.

Gills for long salmon flesh, with white edges, finally brown to dark from the spores, thin and broad.

Stem rather short, about 3—4 × 0,4—0,8 cm., white to yellowish brown, not becoming yellow when bruised, filled to hollow, above slightly attenuated, sometimes with a thickened base.

Flesh whitish, tender.

Basidia tetrasporic, 15 × 4—5 µ. Cheilocystidia not developed.

Spores ovoid, 4,5—5 × 3—3,5 µ.

Hab. Fairly rare fungus growing in lawns, pastures, parks and similar places, mostly among the grass. In other places rare. It looks like a tiny Ag. campester and as in maturity its pileus is yellowish, it is rather reminiscent also of Stropharia coronilla.

I have not yet collected this species in Czechoslovakia. VELENOVSKÝ however lists it from several localities in Bohemia and also described it under several names given among the synonymia of this species. VELENOVSKÝ describes also var. *umbonata* VEL., Novit. Mycol. Novis, p. 83, 1947, which has the pileus 3 cm. in diameter and on the apex a verrucose umbo 5 mm. in diameter. He found it in an oak wood at Mnichovice in Central Bohemia.

Ag. rusiophyllus LASCH. is a species characteristic by its vividly rose coloured gills. It seems however to be rather variable, and in the literature it is besides confused with other small species of the genus *Agaricus*. It is possible that there exist several rare, related species, which also are small and have rose gills. Only further finds and their critical study can elucidate this.

Critical Survey of the Species of the Genus Agaricus (Psalliota), Described by J. Velenovský in his Publications from Czechoslovakia.

Psalliota aromatica VELENOVSKÝ, Novitates Mycol. p. 153, 1939. — Novit. Mys. Noviss. p. 83, 1947.

Pileus 4—4 cm., with obtuse tubercle, white, smooth and shiny. Stem below conically thickened, in the middle 1 cm, and below 2—3 cm. thick, solid, above ashy, striped. Ring broad, membranaceous, horizontally distant, above gray, below white, simple, Gills first rose, then ashy. Spores ovoid-ellipsoid, 5—7 µ. Flesh when broken rapidly turning yellow and smelling strongly. In pine forest among the grass at a warm place at Božkov in Central Bohemia.

In my opinion the description refers to an abnormal specimen. With a diameter of the pileus of 4—5 cm., the base of the stem is given as 2—3 cm. As VELENOVSKÝ writes in Novitates Myc. Noviss., p. 83, that this fungus is perhaps conspecific with *Psalliota odoratissima* VEL., which is only a synonym of *Agaricus arvensis* SCHAEFFER.

Psalliota arvensis SCHAEFF. sensu VELENOVSKÝ, České houby, p. 559, 1921, is apparently understood in a wide sense and includes *Ag. arvensis* SCHAEFF. as well as *Ag. cretaceus* FR. and *Ag. silvicola* sensu J. SCHAEFFER.

Psalliota augusta sensu VELENOVSKÝ, České houby, p. 558, 1921. Very unclear species. The large spores indicate its conspecifity with *Agaricus macrosporus* MOELL. et SCHAEFF. The macroscopic description — except for the spores — fits well also *Ag. augustus* FR., which also grows abundantly in the forests at the localities given. But further on VELENOVSKÝ describes Agaricus augustus Fr. correctly under the name of *Psalliota perrara* BRES. VELENOVSKÝ's large-spored fungus is said to have a pileus of 15—30 cm. in diameter, yellowish, with abundant, imbricately arranged, ochraceous to brown squamules, and which does not change when bruised. Stem below 3—5 cm. thick, much longer than the diameter of the pileus, below gradually thickened. Ring very powerful. On fallen needles in coniferous forests on a limestone substratum in Central Bohemia.

Psalliota autumnalis VELENOVSKÝ, České houby, p. 653, 1921. — Novitates Myc. p. 154, 1939. — Velenovskýi Spec. Basid. p. 216, 1948. VELENOVSKÝ's description is compiled according to mature specimens only. Spores ovoid-ellipsoid, 10—13 µ. Pileus 4—5 cm., broadly convex, smooth, radially covered with brown fibrils, but not squamose, with fragments of the velum at the sharp margin. Stem twice as long as the diameter of the pileus, scarcely 10 mm. thick, smooth, below rapidly attenuated. Flesh when cut ashy violet. Ring fugacious. On a sun-warmed grassy place at Mnichovice, XI. 1917.

The description does not correspond to any species of the genus *Agaricus*, and it seems to me that this fungus does not belong at all to this genus.

Psalliota bivelata VELENOVSKÝ, České houby, p. 562, fig. 88, 1921. — Novitates Mycol. p. 151, 1939. — Velenovskýi Species Novae Basid. p. 216, 1948.

Good description of a fungus which J. Schaeffer identifies with *Psalliota vaporaria* VITT. Velenovský's description and photographic figuring give the first accurate report of this fungus since the time of Vittadini. Cf. *Agaricus villaticus* BRONDEAU.

Psalliota bohemica BENEŠ, 1935. — VELENOVSKÝ, Novitates Mycologicae, p. 153, 1939.

According to the description and figurings I have seen this species is conspecific with *Psalliota bispora* LANGE.

Psalliota bulbosa VELENOVSKÝ, Novitates Myc. p. 153, 1939. Pileus 4—6 cm., conical, then expanded, pure white, smooth, not squamose, rapidly rufescent where bruised, then becoming black. Stem twice as long as the diameter of the pileus, in the middle 6—8 mm. thick, smooth, white, at the base abruptly bulbosely inflated and 2—3 cm. thick. Ring membranaceous. Gills first rose, then ashy. Spores ellipsoid, 4—5 µ. Pleasant smell. In oak wood at Mnichovice, VII-1924. According to the description I cannot identify it with any species, though the description is a little reminiscent of young specimens of *Agaricus Beneši* PILÁT.

Psalliota calcarea VELENOVSKÝ, České houby, p. 562, 1921. — Novitates Myc. p. 152, 1939. — Velenovskýi Spec. Nov. Bas. p. 215, 1948. According to the description it seems to be conspecific with *Agaricus xanthodermus* GENEV. It has spores 5—7 µ. It was collected by Velenovský several times on the limestone hills among the grass above the Radotín valley and at Sv. Prokop in Prague. Spores 5—7 µ long. It may also be compared to *Agaricus chionodermus* PILÁT, which has however much larger spores.

Psalliota campestris L. sensu VELENOVSKÝ, Čes. houby, p. 261, 1921. Velenovský's description is cumulative, as it combines the true *Psalliota campestris* with *Psalliota hortensis* — as after all nearly all authors do.

Psalliota collina VELENOVSKÝ, Myc. p. 152, 1939. — Novit. Mycol. Noviss. p. 182, 1947.

Species conspecific with *Agaricus macrosporus* MOELLER & SCHAEFFER, which was described a year earlier.

Psalliota colivaga VELENOVSKÝ, České houby, p. 561, 1921. — Velenovskýi Species Novae Bas. p. 215, 1948.

According to the description apparently conspecific with *Agaricus bisporus* (LANGE) 1926.

Psalliota comtula FR.—VELENOVSKÝ, České houby, p. 565, 1921. It is conspecific with *Ps. rusiophylla* (Novitates Mycol. p. 154, 1939).

Psalliota comtula FR. var. **umbonata** VELENOVSKÝ, Novitates Mycol. Noviss 83, 1947.

Pileus 3 cm., in the middle with a verrucose tubercle. Stem solid, 5 mm. in diameter. Spores globose-ellipsoid, 5—6 µ long. No smell. In the grass in an oak wood at Mnichovice 1944. It belongs to *Agaricus rusiophyllus* LASCH.

Psalliota cretacea FR. sensu VELENOVSKÝ, České houby, p. 559, 1921. From the description I cannot say with certainty whether the fungus which Velenovský describes is conspecific with *Agaricus cretaceus* in our sense, or what appears to me more probable whether it is

conspecific with *Ag. xanthodermus* GENEV., as Velenovský writes that the gills are for long pale, then nicely rose, and finally black, further that the pileus is snow-white and in old age sometimes cracks into hard, small squamules, all of which agrees with *Agaricus xanthodermus* GENEV.

Psalliota cylindrica VELENOVSKÝ, Novitates Mycol. p. 151, 1939. Pileus 4—8 cm., obtusely campanulate, fuscous alutaceous, rarely with fine brown squamules, in youth not colouring when scratched. Stem white, cylindrical, not thickened in the lower part, 1—1,5 cm. thick, smooth. Gills first white, then ashy, finally black. Spores ovoid, 8—10 µ. Smell pleasant. In spruce forests at Karlštejn, Zbraslav, 1924, 1926. Apparently a form with a darker coloured pileus of *Ag. arvensis* SCHAEFF.

Psalliota depressa VELENOVSKÝ, Novitates Myc. Noviss. p. 83, 1947. Pileus 1—2 cm., convex, depressed in the centre, pale, sparsely finely squamose. Stem twice as long as the diameter of the pileus, 2—3 mm. thick, below slightly thickened, hollow, white, becoming yellow where bruised, with a membranaceous, persistent ring. Gills pale, then black, connected in a collarium, broadly ventricose. Spores ovoid-ellipsoid, 5—6 µ. Smell moderate, pleasant. At Žarošice in Moravia, IX-1940, leg. V. Vacek. It does not turn yellow and has larger spores (5—6 µ) than the other small species of the genus *Agaricus*. The description is unclear, as Velenovský seems to have had only old receptacles. Perhaps it is conspecific with *Ag. rusiophyllus* LASCH., which has sometimes in old age a pileus with an umbo.

Psalliota duriuscula VELENOVSKÝ, Novitates Mycol. Noviss. p. 83, 1947 (non *Ps. duriuscula* Richon et Roze).

Pileus 3—4 cm., fairly thick and stiffly fleshy, white, turning rapidly yellow similar as the stem, not squamose. Stem twice as long as the diameter of the pileus, 4—6 mm. thick, white in the middle, gradually thickening downwards, with a white, quickly fugacious ring. Gills quickly red poppy coloured, then coffee coloured. Spores ovoid, 3—4,5 µ. Pileus later often cracked. On fallen spruce needles. — It is apparently a pale form of *Psalliota semota* FR.

Psalliota exannulata VELENOVSKÝ, České houby, p. 565, 1921. Velenovskýi Species Nov. Basid. p. 217, 1948.

It is apparently a *Psalliota rusiophylla* LASCH. with the ring fallen off. Later Velenovský does not give this species in the list of the genus Psalliota in Novitates Mycologicae, and he seems himself to have considered it a non-existing species.

Psalliota lateritia VELENOVSKÝ, České houby p. 564. — Novitates Mycol. p. 154, 1939.

Pileus 3—4,5 cm., obtusely convex, entirely brick red, covered with fine squamules. Stem as long as the diameter of the pileus, about 3 mm. thick, almost not thickened at the base. Ring broadly opened, membranaceous and white, stem above it smooth, deeply furrowed, below the ring softly sparsely squamose. Gills rose, then scarlet poppy coloured to chocolate. Spores globose, 5 µ. Cystidia large, globose. Smell pleasant. On the steppe hills around Prague.

The rose gills show its affinity with *Agar. rusiophyllus*, but the cystidia indicate rather *Ag. semotus* FR. or *rubellus* GILL. — I have never seen this characteristic fungus.

Psalliota Ludmilae VELENOVSKÝ, Novitates Mycol. p. 155, 1939. This species evidently does not belong to the genus *Agaricus*, but to the genus *Psathyra*, section *Pannucia*, to the affinity of *Psathyra fragilissima* LANGE. According to the description it differs from this species by its pileus being smaller, only 8—10 mm in diameter, and by its carrying on the long, glabrose stem an upright, thinly membranaceous ring, which later disappears. Spores 15—20 µ, amygdaloid, dark brown. Cystidia with ellipsoid base, thinly pointed, clavate at the end, 25—30 µ long. Gills first rose, then chocolate poppy, white on the edge, thin. Pileus expanded-convex, at the apex with a solid umbo, 8—10 mm., often undulate, glabrose, ashy brownish, membranaceous. Among the grass in a forest meadow at Třemblaty, south of Prague, IX-1935.

Psalliota minuta VELENOVSKÝ, České houby, p. 564, 1921. — Velenovskýi Species Novae Basidiomycetum, p. 217, 1948, is according to Velenovský (cf. Novitates Mycologicae p. 154, 1939) identical with *Psalliota rusiophylla* LASCH.

Psalliota nigricans VELENOVSKÝ, České houby, p. 564, (icon) 1921. — Novitates Mycologicae p. 153, 139. — Velenovskýi Species Novae Basid. p. 217, 1948.

The description refers only to adult specimens which were found at Veltrusy, in the grass, VIII-1915. Pileus 3—4 cm., white, on the apex black, the rest covered with black squamules. Stem 5—8 mm. thick, at the base abruptly globosely thickened, becoming brown where bruised. Gills in maturity dark brown. Spores 4—5 µ, ellipsoid. The tiny spores indicate its close affinity with *Agaricus meleagris* J. SCHAEFF. Cf. *Agaricus meleagris* var. *nigricans* (VEL.) PILÁT.

Psalliota odoratissima VELENOVSKÝ, České houby, p. 566, 1921. — Novitates Mycol. p. 152, 1939. — Velenovskýi Spec. Nov. Basid. p. 218, 1948.

It is conspecific with *Agaricus silvicola* sensu J. SCHAEFFER. Its pileus is 6—10 cm., whitish, smooth, then yellow to saffron coloured, torn into tiny, brownish squamules. Stem below thickened into a globose bulb, in old age saffron-yellow. In his work České houby Velenovský states that it has ellipsoid spores, 8—9 µ, in Novitates Mycologicae he maintains that they are ovoid, 4—5 µ, and finally in Novitates Mycol. Novissimae he says that *Psalliota aromatica* VEL. said to have spores 5—7 µ long, is apparently conspecific. This shows that this species of Velenovský is conspecific with *Agaricus silvicola* sensu J. SCHAEFFER, as shown also by the smell.

Psalliota perrara BRES. sensu VELENOVSKÝ, České houby, p. 559, 1921, is conspecific with *Agaricus augustus* FR.

Psalliota Piláti VELENOVSKÝ, Novitates Mycologicae p. 155, 1939. It resembles *Agaricus rusiophyllus* LASCH. and grows similarly in grassy places outside forests, but it is smaller, with the stem 1—2 mm. thick, hollow, turning yellow where bruised, with a squamose, fugacious ring, and with tiny spores, 2—3 µ long, rusty. Smell strong. — Var. **microspora** VELENOVSKÝ is larger, with the pileus 3—4 cm. in diameter, with an obtuse umbo, brown in the centre, pale towards the margin, smooth, non-squamose. Spores 1—2 µ, ovoid-globose, brown. Smell pleasant. In an oak copse at Mirešovice, IX-1934.

Both fungi belong most probably to *Agaricus semotus* FR. or to *Agaricus minimus* RICKEN, if this species is really different. Velenovský's fungus differs strikingly by its tiny spores — if of course the author measured them correctly.

Psalliota pratensis SCHAEFF. sensu VELENOVSKÝ, České houby, p. 560, 1921 and **Psalliota praticola** VITT. sensu VELENOVSKÝ, l. c. which according to Velenovský, Novitates Mycologicae, p. 151, 1939, is conspecific, do not belong according to the description to *Agaricus bisporus* LANGE, but are rather only slightly darker, squamose forms of *Agaricus arvensis* L. Spores 6—8 µ.

Psalliota rosea VELENOVSKÝ, Novitates Mycologicae, p. 155, 1939. Pileus 3—4 cm. in diameter, without umbo, slowly expanded, rusty squamose-fibrillose. Stem twice as long as the diameter of the pileus, brunnescent, with a rapidly fugacious ring, above lined, above the ring smooth, below the ring woolly. Gills broad, white, then rose, finally chocolate and black. Spores ovoid-globose, 4—5 µ. Smell scarcely perceptible. On a heap of rootstocks of *Agropyrum repens* at the edge of a field at Mnichovice, X-1939. It seems to be conspecific with *Agaricus rusiophyllus* LASCH.

Psalliota rusiophylla LASCH sensu VELENOVSKÝ, České houby, p. 565, 1921, is apparently conspecific with *Agaricus rusiophyllus* (LASCH.) in our sense — though it is not excluded that Velenovský's fungus is a form of *Agaricus semotus* FR.

Psalliota sagata FR. sensu VELENOVSKÝ, České houby, p. 565, 1921, is according to VELENOVSKÝ: Novitates Mycologicae p. 154, conspecific wits *Agaricus rusiophyllus* LASCH.

Psalliota semota sensu VELENOVSKÝ, České houby, p. 566, 1921, is according to Velenovský: Novitates Mycologicae, p. 154, 1939, conspecific with *Agaricus rusiophyllus* LASCH. But according to the description it seems to me to be rather conspecific with *Agaricus semotus* sensu RICKEN, which is *Ag. rubellus* (GILL.) SACC.

Psalliota silvatica SCHAEFF. sensu VELENOVSKÝ, České houby 1921. It agrees well with the type. Besides, however, Velenovský described var. **lucorum** VEL., which is white, hardly squamose, or covered with large scales on a white background. It is often more stately. This too brief description may well relate to the lighter varieties of *Agaricus silvaticus* SCHAEFF., as I found them myself in the field, e. g. to var. *pallens* PILÁT.

Psalliota squamulosa VELENOVSKÝ, České houby, p. 567, 1921. — Novitates Mycologicae p. 154, 1939. — Velenovskýi Spec. Nov. Basid. p. 218, 1948.

Pileus 3—4 cm., broadly convex, with a sharp margin, whitish, smoothly shinily fibrillose, decorated with adpressed brown squamules, which are large in the middle and minute at the margin. Stem slightly longer than the diameter of the pileus, about 5—6 mm. thick, not

thickened at the base, white, hollow, below the middle provided with a squamose ring, otherwise entirely covered with minute brown squamules which fuse at the annulary. Gills broadly ventricose, in youth red, then turning black Spores brown, large, broadly ellipsoid, 8—10 µ long.

On a mossy landmark furrow on the road at Struhařov, VII-1919. I do not know with which species this fungus could be conspecific. Perhaps it is a good species.

Psalliota suaveolens VELENOVSKÝ, Novitates Mycol. Noviss. p. 82, 1947. Pileus 5—6 cm., plane-convex, with an obtuse umbo, pale copper coloured, densely covered with imbricate and concentric fine squamules. Stem barely twice as long as the diameter of the pileus, gradually thickening towards the base, above never turning black, turning rusty where bruised, in the middle 7—10 mm. thick, with a white, papery, persistent ring. Gills broad, white, then scarlet poppy coloured, finally black. Spores ovoid-ellipsoid, coffee brown, 3—5 µ. Flesh of pleasant smell. It seems to be conspecific with *Agaricus rubellus* GILL.

Psalliota umbrosa VELENOVSKÝ, Novitates Mycol. Noviss. p. 82, 1947. Pileus 4—5 cm. in diameter, slowly convex, smooth, thin, brown, with the cuticle cracked into very fine squamules. Stem twice as long as the diameter of the pileus, in the middle 6—8 mm. thick, at the base little thickened, white, naked, above with a membranaceous, persistent ring. Velum membranaceous, leaving behind fragments at the margin of the pileus. Gills white, slightly scarlet poppy coloured, then black. Spores subglobose, 3—4 µ, little transparent. Flesh of pleasant smell and turning yellow where bruised. In shady spruce forests at Myšlín, IX-1941.

According to Velenovský it belongs to the affinity of *Ag. arvensis*, which is in contradiction to the small spores and the small measurements of the pileus. I think it more likely that it belongs to *Agaricus rubellus* GILL., in which the stem also turns yellow at the base.

Psalliota xerophila VELENOVSKÝ, České houby, p. 566, 1921. — Novitates Mycol. p. 154, 1939 (misprinted Ps. xerophylla). — Velenovskýi Spec. Nov. Basid. p. 218, 1948.

Pileus 3—5 cm, in diameter, broadly conically convex, at the apex reddish brown, towards the white margin delicately brown fibrillose. Stem below little thickened, about 6 mm. thick, turning yellow where bruised. Gills rose, then coffee-brown. Smell slight. Spores ovoid-ellipsoid, 4—5 µ. Among the steppe vegetation on rocks at Sv. Prokop in Prague, X-1918.

It is *Agaricus rusiophyllus* LASCH. with the pileus 3—5 cm. in diameter, slightly developed ring, and thicker stem, apparently under the influence of the dry habitat.

Diagnoses latinae specierum novarum.

Agaricus Caroli sp. n.

Pileus 6—16 cm. diam., e late glandiformi subhemisphaerico, apice subapplanato, demum explanato, haud raro statu adulto centro paulisper depressus, cute subtenui, albido-grisea vel albido-fusca

tectus, apice excepto, iam de iuventute in squamas regulares, distinctas carni albae insidentibus dirrupto.

Lamellae albidae, mox laete roseae vel salmoneae, dein rubro-cacainae et adultae nigrae, relativiter sero humescentes, sat confertae et liberae.

Stipes 6—9 × 1,5—2 cm, crassus et brevis, cylindraceus, basi haud raro paulisper incrassatus, sed haud abscissus, parte basali, praecipue iuventute, plerumque nonnulis seriebus irregularibus squamarum sat magnarum albarum usque annuliformium ornatus, dein haud raro paulisper gossypino-subsquamulosus, praecipue parte inferiori, albus, supra annulum subtiliter fibrillosus, vulneratus vel sectus rubescens, dein fuscescens. Specimina iuvenilia secta cito et conspecte rubescunt (color aurantio-salmoneus, dein salmoneus), specimina adulta parum rubescunt.

Annulus membranaceus, subfirmus, diu permanens, bistratosus, colariformis, subtus praecipue parte marginali radialiter fissus.

Sporae in cumulo fuligineo-nigro-fuscae tinctu purpurino.

Caro alba, pilei mollior, stipitis firmior, secta vel vulnerata, praecipue iuventute, aëre cito salmoneo-rubescens, dein fuscescens, odore debili, inconspecto (paulisper iucunde maliodora), sapore inconspecto, iucunde fungineo.

Basidia tetraspora, 7—8,5 × 25 µ. Cheilocystidia in acie lamellarum plerumque crebra, saccato-clavata, 8—13 × 20—27 µ.

Sporae ellipsoideae, apiculo obliquo guttaque una eleosa centrali praeditae, fuscae tinctu purpurino, 6—7,5 × 4—4,8 µ.

Hab. In Piceto alto solo calcareo prope Karlštejn („Fons Regis"), Bohemae centralis, quotannis frequens (Augusto usque Septembre), sed solum loco uno, ca 100 m² magno apparet: 13. IX. 1946, 20. IX. 1946, 19. IX. 1947, 26. IX. 1948, 18. IX. 1949, 3. VIII. 1950, 9. VIII. 1950, 12. VIII. 1950, 20. VIII. 1950, 8. X. 1950.

Haec species *Agarico Beneši* PILÁT proxime accedit. Differt stipite constanter breviori crassirorique, pileo magis distinctiusque squamoso carneque magis rubescenti.

Agaricus Deylii sp. n.

Pileus e globoso-ovoideo semigloboso-convexus, diu velo clausus, candidus, immutabilis, iuvenilis paulisper udus, sed haud viscidus, haud squamosus, sed non glaber, superficie hyphis fibrillosis liberatis, conglomerata irregularia fibrilloso-squamiformia et solum sub lente visibilia efformantibus et tactu paulisper sordide colorantibus tectus, centro subglaber, sed haud lucidus, iuvenilis veloque clausus 6 cm diam., dein probabiliter subplane convexus et usque 10 et plus cm, latus (solum specimina iuvenilia in manu habui).

Lamellae rosaceae tinctu carneo, iam in pileo velo clauso coloratae, acie albidae.

Stipes subregulariter cylindraceus, subcrassus, in speciminibus meis iuvenilibus 6—10 × 2 cm, basi solum parum incrassatus vel haud incrassatus et ibi 2,5 cm crassus, basi plus minus obtuse finiens, sed haud plane abscissus, candidus, sericeo-fibrillosus, subgla-

ber, solum sub annulo fibrillis paucis et parvis squamuloso-liberatis destitutus, basi tactu lenissime, paulisper sordide rufo-fuscescens, iam iuventute cylidraceo-cavus.

Annulus bistratosus, strato inferiori margine dentato, cum parte apicali stipitis coniunctus, candidus, membranaceus, subfirmus.

Caro alba, secta distincte sed parum intensive rubescens, parte insertionis stipitis saepe rubescens tinctu aurantiaco vel rhebarbarino. Etiam loci vulnerati in stipitis superficie leniter rubescunt. Caro pilei alba, secta fere immutabilis. Demum color ruber leniter evanescit et in colorem sordide ferrugineum vel sordide fuscum mutatur. Odor debilis, inconspectus, haud aniseus. Sapor inconspectus.

Basidia tetraspora, 8—10 × 20—30 µ. Cheilocystidia ovato-piriformia, acie lamellarum crebra, 15—22 × 27—30 µ.

Sporae subelongato-ellipsoideae, 9,5—11 × 5,3—6 µ.

Hab. in Piceto solo calcareo prope Boubová, haud procul Karlštejn, Bohemiae centralis, 20. IX. 1950, Dr. Miloš Deyl, cui speciem dedicavimus, legit. Solum 8 carposomata iuvenilia in manu habui.

Haec species nova habitu macroscopico valde Agaricum chionodermum Pilát in mentem revocat, sed caro eius rubescit. E sectione Sanguinolentae *Agarico Beneši* Pilát simillima est, sed sporis multo majoribus, stipiteque breviori discrepat. Habitu fungus noster novus colore candido, carne alba solum leniter rubescenti et dimensionibus sporarum dignoscitur.

Agaricus silvaticus f. *fagetorum* f. m. n.

Differt a typo squamis majoribus, fere gossypinis, pallide rufis, carni albidae insidentibus. Annulus indistincte bistratosus. Caro minus rubescens. Sporae parvae, ut in typo: 6—6,3 × 3,5—4 µ.

Hab. in Fagetis prope Stříbrná Skalice, Bohemiae centralis („Studený vrch"), 12. VIII. 1950, Zdeněk Pouzar legit.

Agaricus Annae sp. n.

Pileus 7—9 cm latus, in statu adulescenti late conice campanulatus, dein explanatus, sed plerumque umbone humili carnoso-que instructus, apice pallide ochraceo-fuscidulus, ceterum albidus, in squamas adpressas, distinctas, pallide ochraceas vel subrubescentes, substrato fere albo sericeo insidentes dirruptus, cute viva trita fere haud rubescenti.

Stipes subtenuis et longus, quam in Agarico silvatico longior, 10—16 × 1—15 cm, parum curvulatus, laevis, subglaber, solum paulisper fibrillosus et usque ad basim paulisper floccoso-squamulosus, sordide albus, sericeus, vulneratus paulisper sordide rubescens, dein brunnescens, sed plerumque minus quam Agaricus silvaticus, regulariter cylindraceus vel parte basali paulisper incrassatus, sat profunde in terra submersus.

Lamellae confertae, liberae, carneo-roseae tinctu subviolaceo, dein chocolateae, adultae a stipite remotae, acie heteromorpha

praeditae. Cheilocystidia saccato-piriformia, tenuiter tunicata, hyalina, 25—35 × 10—14 µ. Basidia tetraspora.

Sporae ellipsoideae, apiculo subobliquo praeditae, 9—11 × 5—5,5(6) µ.

Caro alba vel sordide alba, aëre rubescens, sed minus quam in Agarico silvatico.

Hab. in Piceto solo calcareo prope Karlštejn, Bohemiae centralis, (loco „Vodopády" dicto 3 exemplaria, prope „Královská studánka" 2 exemplaria), 3. VIII. 1950 A. Pilát legit.

Iterum 15. IX. 1950 prope Karlštejn-Boubová in Piceto 7 exemplaria adulta inveni. Pileus in statu adulto 7—10 cm latus, semper quam in Agarico silvatico vel A. haemorrhoidario multo pallidior, apice sordide ochraceus, ceterum pallide ochraceo-fuscidulus, substrato albido fuscidulo-squamosus, semper, etiam in speciminibus vetustis, absque colore rubro vel ferrugineo.

Caro in speciminibus adultis non rubescit. Stipes 9 × 1,2—1,8 cm, basi usque 2,5 cm crassus, cylindricus, basim versus saepe clavato-incrassatus, sed ima basi haud tuberosus. Cheilocystidia in speciminibus adultis globoso-piriformia, usque 28 µ crassa. Sporae 7,8—9,3(10) × 5,5—6 µ. Basidia tetraspora.

Fungus hic in affinitatem Agarici haemorrhoidarii Schulzer pertinet, sed primo visu pileo pallido, distinctius subtiliusque squamoso dignoscitur. Sporas aulisper majores quam species commemorata habet.

Agaricus osecanus sp. n.

Pileus iuvenilis subconice globosus, dein plane convexus, adultus usque 10 cm diam., haud lucidus, solum paulisper sericeus, in squamulas subtillimas exclusive centro diffractus, marginem versus potius fibrillosus quam squamulosus, subcrasse subfirmeque carnosus, albus tinctu lutescenti (sed minus quam Agaricus arvensis), centro haud raro paulisper albido-griseolus, margine diu paulisper involutus et fragmentis veli ornatus.

Stipes relativiter brevis tenuisque, 5—6 × 1,3—1,7 cm, cylindraceus, basi minime clavato-incrassatus, sed haud tuberosus, imma basi rotundatus, haud plane abscissus, candidus, supra annulum subtiliter sericeo-fibrillosus, sub annulo paulisper squamulosus, basi haud raro squamulis circulos incompletos componentibus ornatus, at ibi vulneratus paulisper sordide lutescens.

Annulus magnus, bistratosus, subtus conspecte verrucoso-squamosus, supra albus glaberque, sed paulisper rugosus, margine plerumque dentatus, albus.

Lamellae iuventute, — hactenus pileus velo clausus est — subgriseae, dein griseo-carneae usque chocolateae, numquam laete roseae.

Caro secta minime et solum leniter lutescens. Cutis pilei stipitisque trita minime leniterque lutescens, cum KOH statim laete lutescens. Odor aniseus debilis. Sapor inconspectus.

Sporae globoso-ellipsoideae, magis globosae quam in Agarico

arvensi, 7—7,5 × 5—5,5 µ. Cheilocystidia ovoideo-piriformia, tenuiter tunicata. Basidia tetraspora.

Hab. In silva frondosa humida in gramine prope Velký Osek, Bohemiae orientalis, 20. 9. 1950 Dr. Miloš Deyl legit. (4 carposomata).

Agarico arvensi Schaeffer et Ag. cretaceo sensu nostro valde affinis, sed minus lutescens, stipite conspecte tenui brevique, annulo magno sporisque magis globosis dignoscitur.

Agaricus arvensis var. *macrolepsis* Pilát et Pouzar.

(? Agaricus arvensis sensu Fries Aetl Svampar IV.)

A typo pileo conspecte imbricato-squamoso differt. Squamae magnae, modo fere concentrico dispositae, adpressae, solum apicibus paulisper squarrosae. Pileus albus, Iove sicco palide ochraceo-lutescens. Odor aniseus. Caro vulnerata lutescens. Basidia tetraspora. Sporae ovoideo-ellipsoidae, 9—9,5 × 5—5,5 µ.

Hab. In Piceto solo calcareo propo Karlštejn-Boubová, Bohemiae centralis, 9. 8. 1950, Pilát et Pouzar legerunt. (4 exemplaria). 1. 10. 1950 loco citato iterum 2 corposomata Z. Pouzar legit.

Agaricus chionodermus sp. n.

P i l e u s usque 15 cm diam., primum globosus vel apice applanatus, dein explanatus centro parum prominens, margine diu involutus, candidus, sericeo-lucidus, solum raro tinctu lutescenti-fusco, radialiter sericeo-fibrilosus, iam iuventute in squamulas inconspectas, tenues subtillimasque, sed sat magnas, agglutinatas solutus. Squamulae haec ut pileus totus coloratae sunt et Iove sicco fere evanescunt. Cutis usque ad apicem secernebilis, candida, vulnerata immutabilis et demum post horas multas lutescens.

S t i p e s relativer longus et conspecte profunde in terra immersus, 6—12 × 1,5—2,5 cm, candidus, cylindraceus, basi haud bulboso-incrassatus, rarius basi paulisper crassior et imma basi rotundatus vel fusoideo-attenuatus, imma basi haud raro post horas 24 lutescens (rarius iam in natura basi lutescens), totus squamis adpressis, irregularibus, albis, plerumque agglutinatis et haud raro in seriebus irregularibus dispositis ornatus, qua de causa stipes haud raro usque annulato-tigrinus, subfirme carnosus, firmior compactiorque statu adulto, minusque cavus quam Agaricus arvensis.

A n n u l u s bistratosus, submagnus, subtus in frustula irregularia sat magna dentataque, apice haud sublutescentia diffractus, ceterum albus.

C a r o candida, solum basi stipitis intus paulisper sublutescens, trita, vulnerata vel secta immutabilis, haud lutescens et demum post horas 24 plerumque color debilis luteus apparet, inodora vel odore parum conspecto, sed haud aniseo, ut in Agarico arvensi, sapore agaricino, haud conspecto.

L a m e l l a e primum albidae, mox et diu laete roseae (fere ut in Agarico silvatico vel A. xanthodermo), dein fusco-rubeolae usque nigrae, confertae et liberae. Basidia tetraspora, 27 × 8—10 µ. Cheilocystidia in acie lamellarum piriformia, vel clavata, plerumque inconspecta, subsparsa, parum a basidiis differenciata, 15 × 9 µ, demum evanescentia.

S p o r a e ellipsoideo-amygdaliformes, apiculo paulisper obliquo instructae 8,5—(10,5) × 4,8—6 µ.

Hab. In Picetis solo calcareo prope Karlštejn („Královská studánka") locis plurioribus: 27. 7. 1950, 3. 8. 1950, 12. 8. 1950, 20. 8. 1950 in permultis exemplaribus. Ad marginem silvae frondosae sub Aesculo hippocastanum prope Velký Osek 21. 9. 1950 duo carposomata iuvenilia Dr. Miloš Deyl legit. (Sporae ellipsoideae 9,2 × 5,5 µ. Cheilocystidia 13 × 22 µ). Lamellae speciminum iuvenilium (velo clausorum) haud raro iam roseo-coloratae sunt. Habitu macroscopico haec species Agarico arvensi valde similis est, sed carne fere immutabili, odore haud aniseo et stipite in terra magis submerso facile dignoscitur. Edulis, sapore amoeno.

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REDAKTOR IVAN KLÁŠTERSKÝ

ALBERT PILÁT: ČESKÉ DRUHY ŽAMPIONŮ (AGARICUS). THE BOHEMIAN SPECIES OF THE GENUS AGARICUS.

V LEDNU 1951 VYDALO SVÝM NÁKLADEM V POČTU 1100 VÝTISKŮ NÁRODNÍ MUSEUM V PRAZE - VYTISKLA STÁTNÍ TISKÁRNA, N. P. 02. - CENA BROŽOV. VÝTISKU 247·- Kčs

Agaricus Caroli PILÁT

Agaricus Annae PILÁT

Agaricus chionodermus PILÁT

Photo A. Pilát.

Tab. IV. *Agaricus edulis* (VITT.) MOELL. et SCHAEFF.
Bohemia: Smiřice nad Labem, in horto castelli loco ruderali, 31. VII. 1949, J. Nitka legit. 1/1 orig. Specimina iuvenilia.

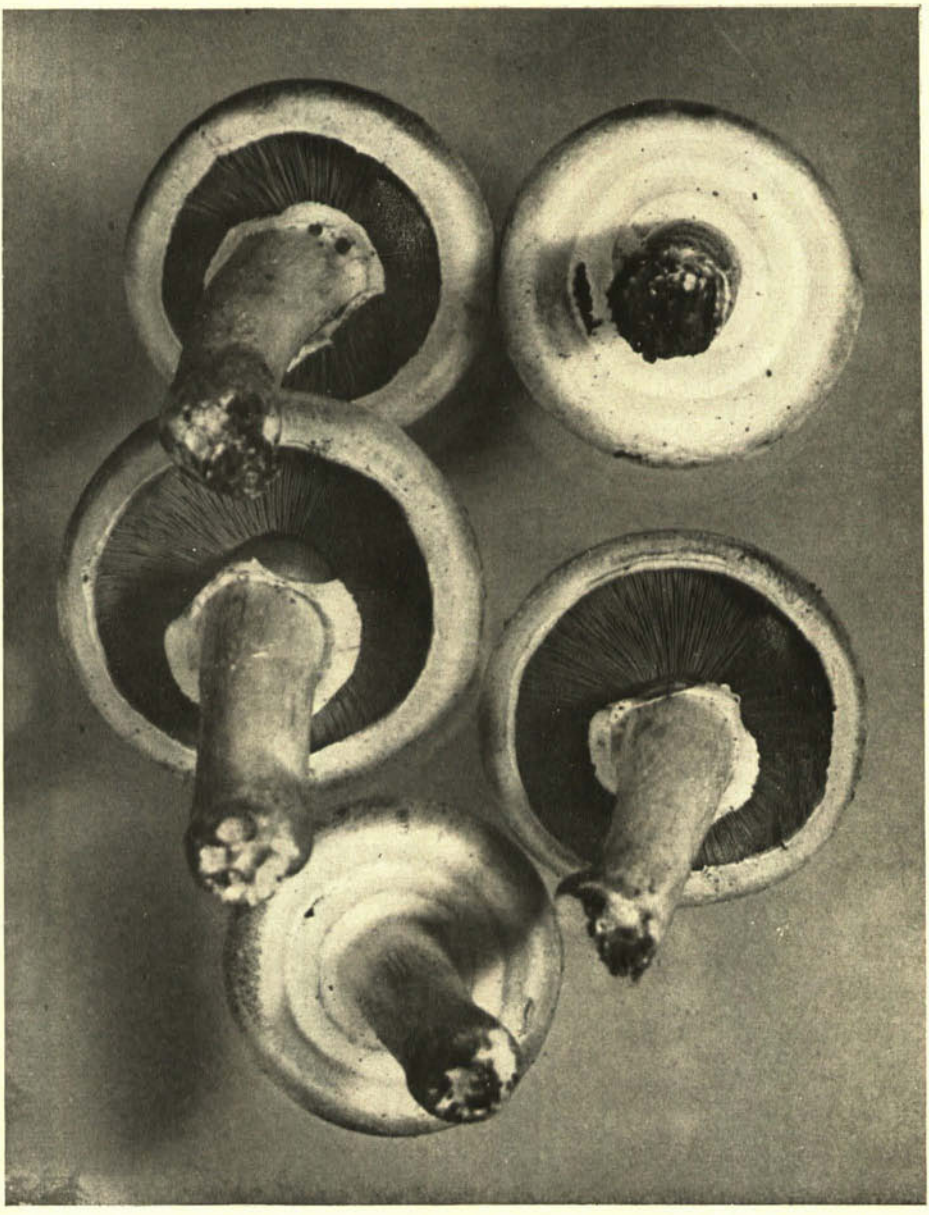


Photo A. Pilát.

Tab. V. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, specimina e mycelio "Svit" culta, 24. X. 1950. ¾ orig.

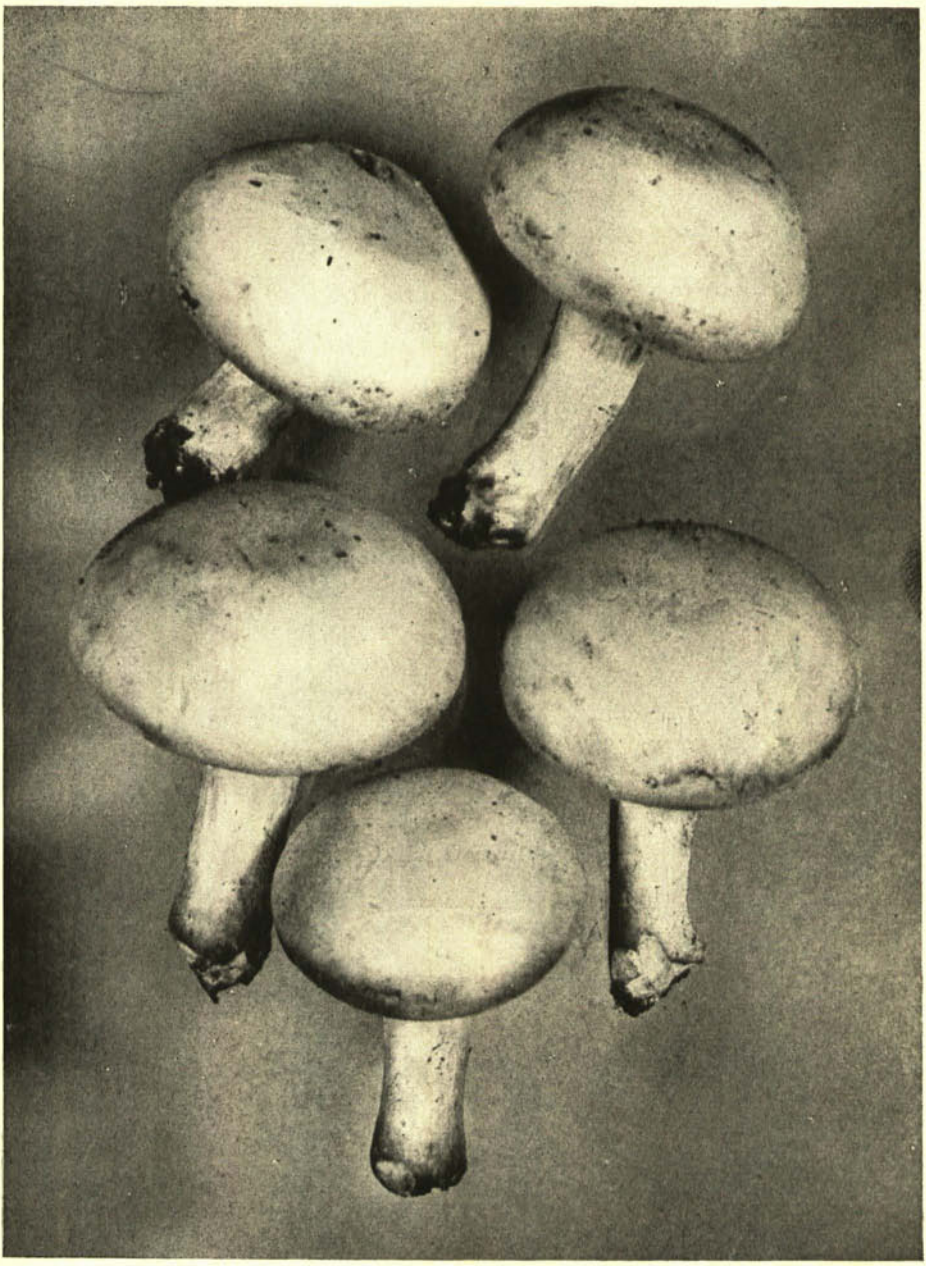


Photo A. Pilát.

Tab. VI. *Agaricus hortensis* COOKE.
Bohemia: Praha-Troja, specimina e mycelio "Svit" culta, 24. X. 1950. ¾ orig.

Photo A. Pilát.

Tab. VII. *Agaricus bisporus* LANGE.
Bohemia: Lysá nad Labem, in Piceto, 5. VI. 1950, leg. Ing. Lukavec. $^{6}/_{5}$ orig.

Photo Ivan Charvát.

Tab. VIII. *Agaricus villaticus* BROND.
Bohemia: Praha II, Václavské nám. no. 14, 10. IX. 1948, Rudolf Mlynařík legit.
· ⅔ orig.

Photo A. Pilát.

Tab. IX. *Agaricus Caroli* PILÁT.
Bohemia: Karlštejn, in Picetis prope Královská studánka, solo calcareo, VIII.—IX. 1948, leg. A. Pilát, ⅔ orig.

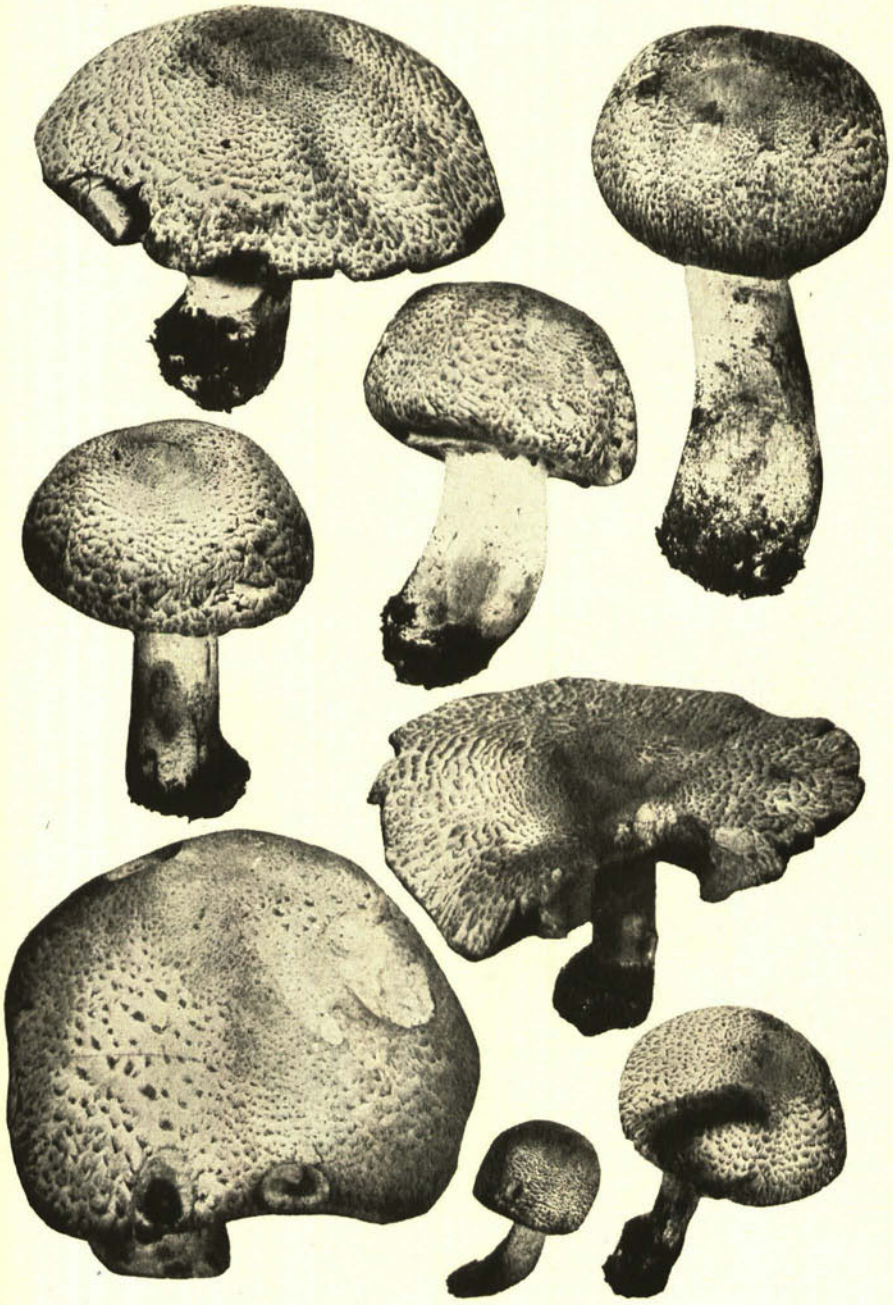


Photo A. Pilát.

Tab. X. *Agaricus Caroli* PILÁT.

Bohemia: Karlštejn, in Picetis prope Královská studánka, solo calcareo, VIII.—IX. 1950, leg. A. Pilát. ½ orig.

Tab. XI. *Agaricus haemorrhoidarius* SCHULZER.

1. Solopisky prope Pragam, in silva mixta sub Picea, 4. VI. 1950 legit. Jul. Hanči, photo Ivan Charvát. ⅔ orig.

2. Ibidem, 4. VI. 1950, Pilát et Pouzar legerunt. ⅔ orig. Photo A. Pilát.

3.—5. Bohemia: Karlštejn, in Picetis solo calcareo, 9. VIII. 1950, leg. et photo A. Pilát.

Photo A. Pilát.

Tab. XII. *Agaricus augustus* Fr.
Bohemia: Karlštejn, in Picetis solo calcareo, IX. 1946 et VIII.—IX. 1950, A. Pilát legit. ½ orig.

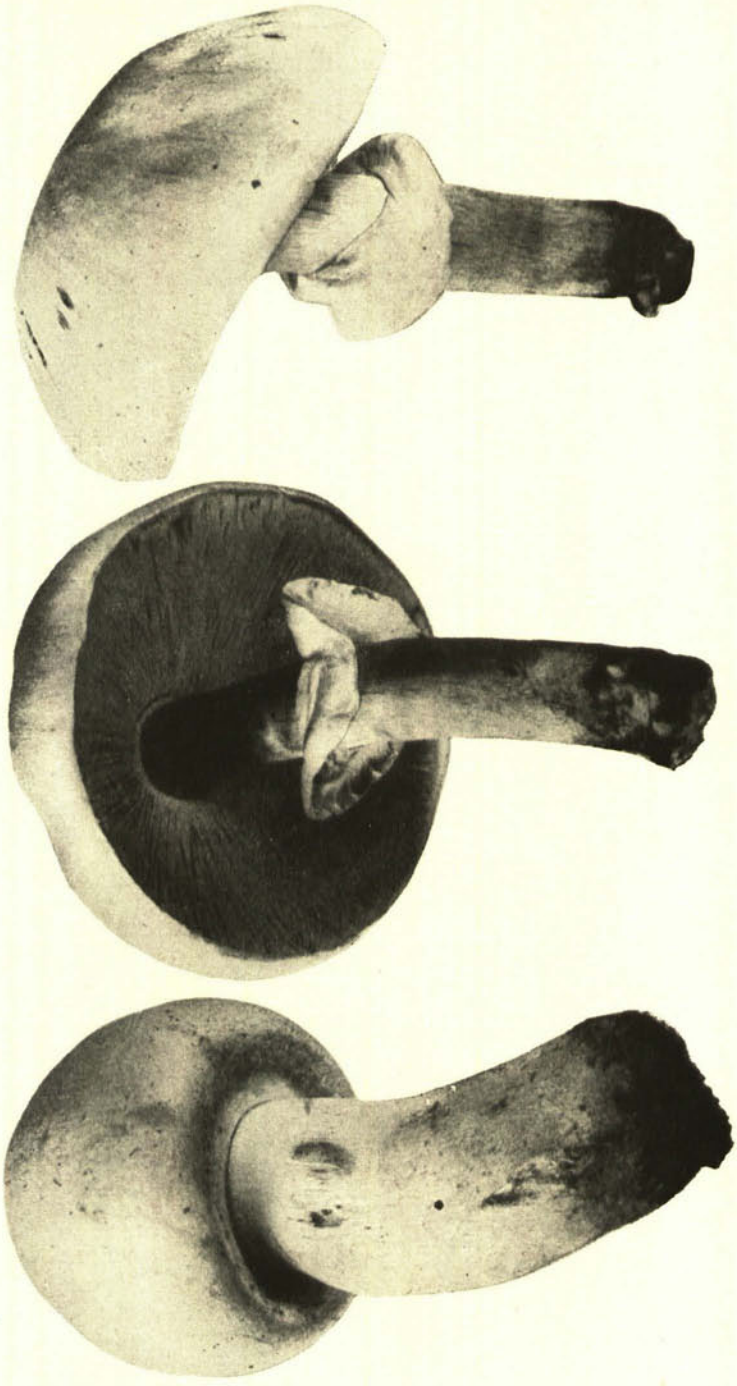


Photo A. Pilát.

Tab. XIII. *Agaricus cretaceus* Fr.

Bohemia: Černolice prope Dobřichovice, in silva mixta, 20. VII. 1950, A. Pilát legit.
Specimen iuvenile ⅔ orig. et duo specimina adulta ½ orig.

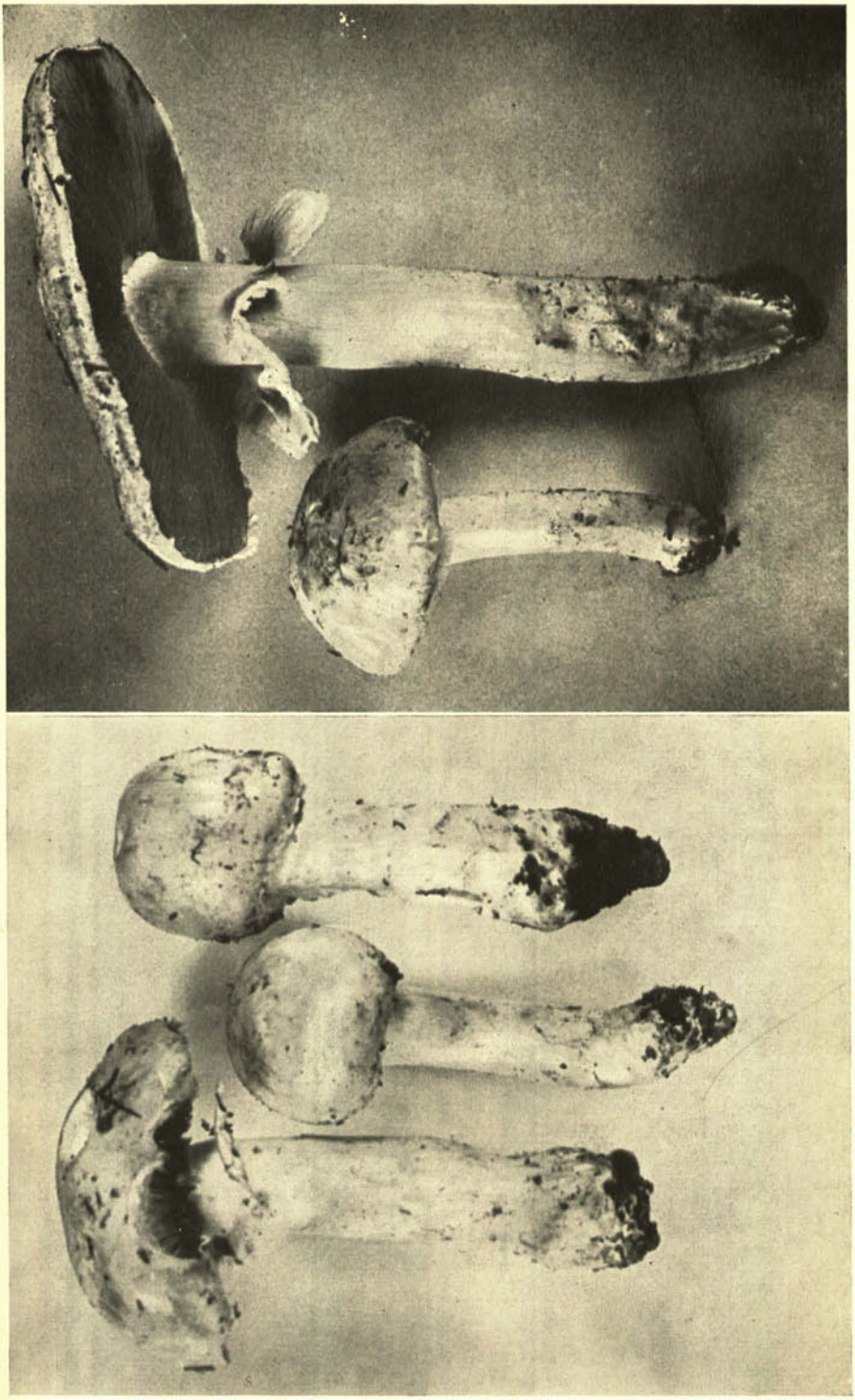
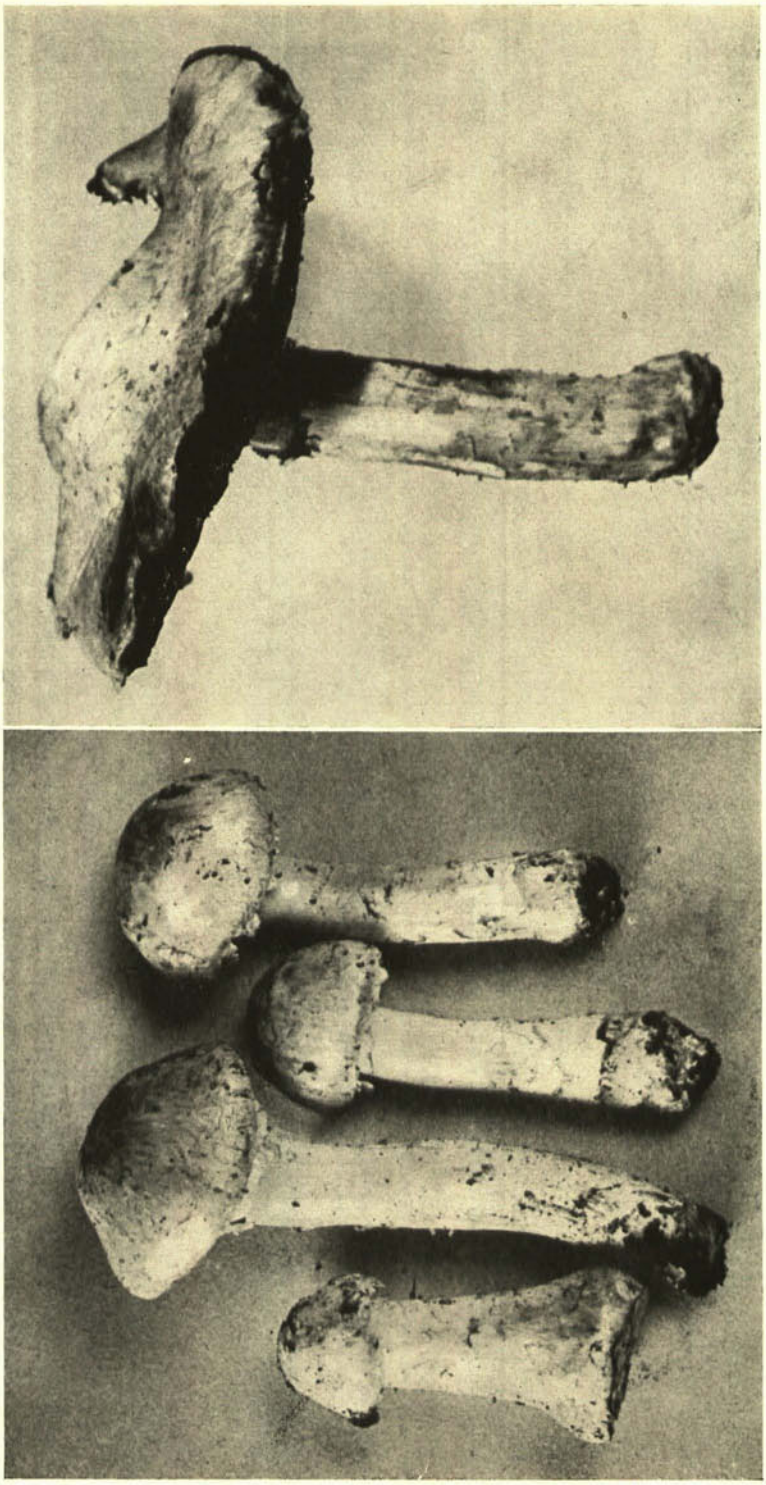


Photo A. Pilát.

Tab. XIV. *Agaricus chionodermus* PILÁT.
Bohemia: in Picetis solo calcareo prope Královská studánka, 3. VIII. 1950 et 30. VII. 1950, legit A. Pilát. $^2/_3$ orig.



Tab. XV. *Agaricus chionodermus* PILÁT. Photo A. Pilát.
Bohemia: in Picetis solo calcareo prope Královská studánka,
Specimina iuvenilia, 30. VII. 1950, leg. A. Pilát ⅔ orig.
Specimen adultum, 20. VIII. 1950, leg. A. Pilát, ½ orig.

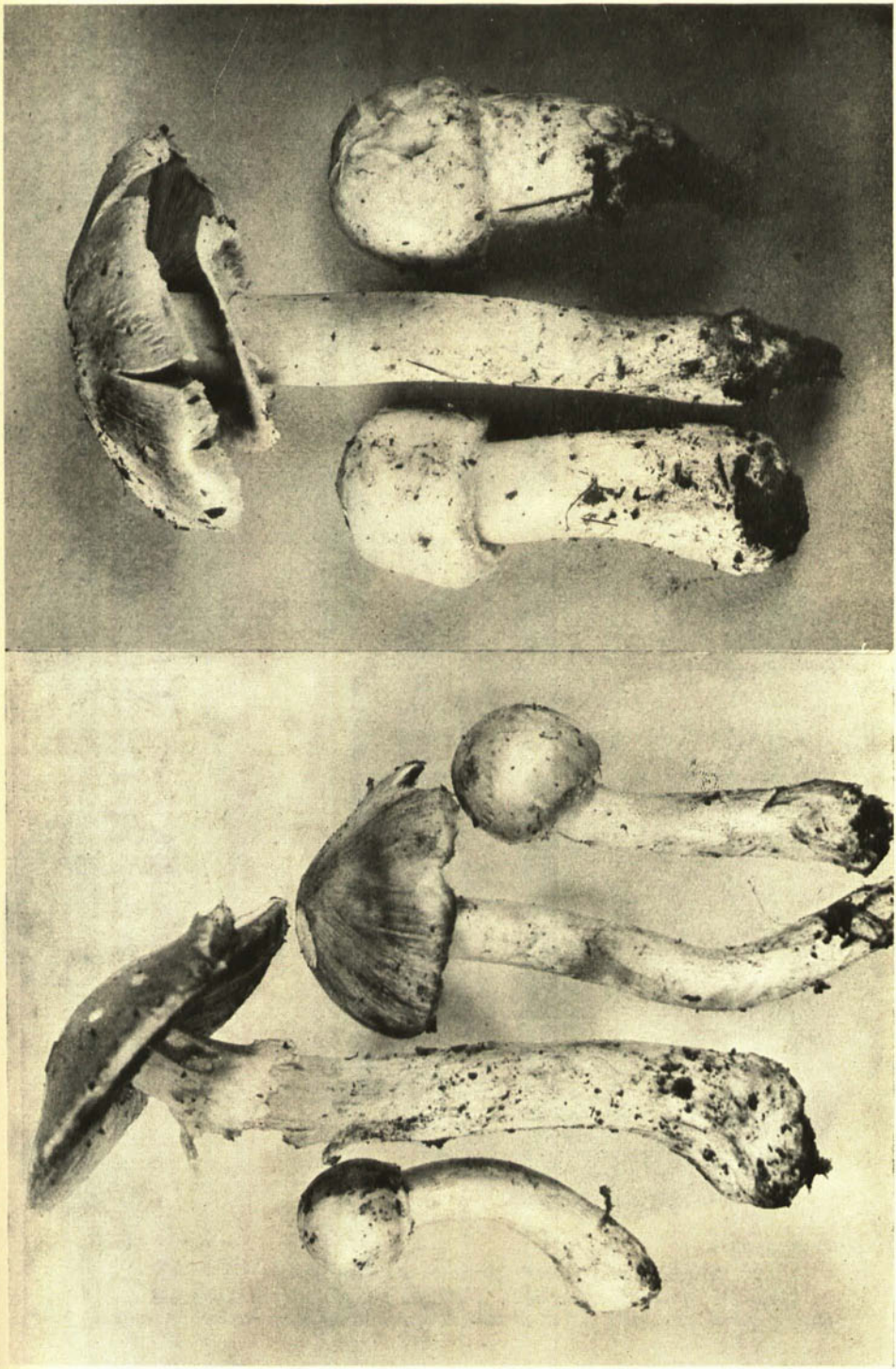


Photo A. Pilát.

Tab. XVI. *Agaricus chionodermus* PILÁT.
Bohemia: in Picetis solo calcareo prope Královská studánka, 30. VII. 1950, leg. A. Pilát. ⅔ orig.

Photo Ivan Charvát.

Tab. XVII. *Agaricus meleagris* J. SCHAEFFER.

1.—2. Bohemia: Praha-Šárka, 10. VIII. 1944, leg. Fr. Kodl, 1/1 orig.
3.—5. Bohemia: Zahořanské údolí prope Pragam, 2. VI. 1944, leg. Zoul, 1/1 orig.