

## Notes on Indonesian Fungi.

### The genus *Amanita*.

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With 5 Textfigures.

#### Introduction.

Representatives of the genus *Amanita* are found all over the world, but the majority of the species is restricted to temperate regions and only a small number is known from the tropics. Especially from Africa several forms were described rather recently.

In Indonesia up to now 2 species and 2 varieties are recorded, viz. *Amanita vaginata*, *A. vaginata* var. *angustilamellata*, *A. vaginata* var. *pallido-carnea* and *A. hemibapha*.

After studying the collections in the Herbarium at Bogor, and the material which I could collect in the course of years, it now appears, that there are 11 species of *Amanita*.

The true European *A. vaginata* does not occur in our region and the varieties of this species mentioned above are better regarded as independent species.

The greater part of the material I could investigate in the fresh state: the rest consisted of collections preserved in alcohol.

A serious drawback in the study of *Amanita* in our region is formed by the scarcity of the material. They may be sought in vain for a long time or only a single carpophore or a few scattered specimens are to be found. Furthermore the fructifications are very perishable and often infested by insects. So in many instances I could not find an annulus in species where such a structure is to be expected.

Only when new material can be procured, a more detailed description of some of the species will be possible.

Most of the species are to be found in the mountain forests at rather high elevations and only a few were collected at low altitudes. The arrangement of the species is in accordance with that of Gilbert (2), only the proposed genera I have treated as subgenera just as was done by him in a previous paper (1). For the subgenus *Amanita* I have chosen the name *Euamanita*.

The colour notes were made with the aid of R. Ridgway's „Color standards and color nomenclature“. Washington 1912.

**Amanita** S. F. Gray, Nat. Arrang. Brit. Pl. I. 599, 1821.

Pileus regular, margin smooth, striate or sulcato-striate. Pellicle mostly sharply defined, sometimes separable. Dry or somewhat viscid, white or coloured, with or without remnants of the veil in the shape of patches or warts. Flesh thin or more or less well developed, white or pale coloured. Gills free or nearly free, intermediate gills mostly cut squarely behind, white or pale coloured; trama bilateral, edge with vesicular cells. Stem central, hollow or solid, with or without a bulbous base, annulus present or absent. Volva distinct, free, adnate or only remnants in the shape of rings or flocci. Basidia mostly 4-spored, clubshaped. Spore print white, pale cream, seldom with greenish hue. Spores globose, subglobose, ovoid, elliptic till nearly cylindric, smooth; with or without amyloid cellwall.

A. Spores non amyloid.

Subgenus *Amanitopsis*. — Pileus thin, often subumbonate, margin sulcato-striate. Stipe hollow, not bulbous, with a free volva at the base. No annulus. Spores globose till ovoid.

**Amanita angustilamellata** (v. Höhn.) Boedijn nov. comb.

Syn.: *Amanitopsis vaginata* var. *angustilamellata* v. Höhn. Sitzb. Akad. Wiss. Wien, Math. Nat. Kl. Abt. I. CXXIII. 74, 1914.

Pileus convex till plano-convex, sometimes slightly subumbonate; margin sulcato-striate, nearly halfway the cap, often splitting along the grooves: 4—9 cm in diam. Surface smooth or seldom with a few rather large white patches. Colour gray, darkest at the centre, which is about drab, gradually changing into light drab till smoke grey near the margin. Flesh thin, white, 2—3 mm thick near the stalk, rapidly thinning out near the margin. Gills free, white or about pale pinkish buff, 3—7 mm high in the middle. Stalk slender, hollow dirty white, nearly smooth, with some indistinct dark innate fibrils near the base; attenuated near the apex, 9—12.5 cm long, 7—15 mm broad in the middle, 5—8 mm near the top. Wall of stalk about 2 mm broad. Volva free, sheathing the base of the stem, white, 2.5 cm high, up till 2 cm broad. Basidia 4-spored, clubshaped, 45—51  $\mu$  long, 12—14  $\mu$  broad at the top. Spores globose, 9—12  $\mu$  in diam. Cells on edge of gills globose till subglobose, 15—27  $\mu$  long.

Javn: Tjibodas, ca. 1500 m 27. XI. 1921 Docters van Leeuwen; V. 1923. Bruggeman; X. 1938 Boedijn; Poentjak-pass XII. 1940 Boedijn.

This species is well characterised by its narrow gills and its drab grey colour. As can be seen from the cross-sections depicted (Fig. I). the

European *A. vaginata* is quite different.. I never found the true *A. vaginata* in Indonesia and I believe, that this species does not occur in the tropics.

***Amanita pallido-carnea* (v. Höhn.) Boedijn nov. comb.**

Syn.: *Amanitopsis vaginata* var. *pallido-carnea* v. Höhn. Sitzb. Akad. Wiss. Wien, Math. Nat. Kl. Abt. I. CXXIII. 74, 1914.

Pileus plano-convex sometimes slightly subumbonate, margin sulcato-striate nearly halfway the cap, smooth, 6—7 cm in diam. Colour dark blackish brown, about olive brown, fuscous or fuscous black, changing into buffy brown, drab or cinnamon drab near the margin. Flesh thin, nearly white, 1.5—2 mm thick near the stalk, rapidly thinning out near the margin. Gills free, of a beautiful pink colour, about salmon color or between salmon color and salmon buff,

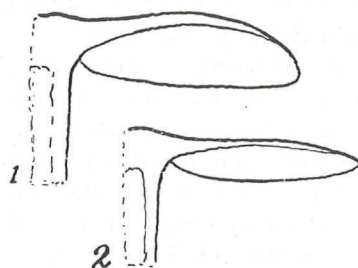


Fig. I. 1. *Amanita vaginata*. — 2. *Amanita angustilamellata*.

4—5 mm high in the middle. Stalk hollow, smooth, pale pink about between salmon buff and seashell pink: attenuated near the apex, 10.5—13 cm long, 12—15 mm broad near the base, 7—8 mm near the top. Volva as in the preceding species. Basidia 4-spored, clubshaped, 58—64  $\mu$  long, 15—20  $\mu$  broad near the top. Spores globose, 10—14  $\mu$  in diam. Cells on edge of gills globose till elongated, 37—54  $\mu$  long.

J a v a, Poentjak-pass, XII. 1940, B o e d i j n; Tjibodas, VII. 1950, B o e d i j n.

This species is easily recognizable by its very dark cap and pink gills and stalk.

***Amanita aporema* Boedijn nov. spec.**

Pileus e campanulato expansus, glaber, margine striato-sulcatus, rufobrunneus, 8—14 cm diam.; caro alba; lamellae liberae, cremeae, 7—11 mm altae; stipes exannulatus, attenuatus, cavus sordide albidus, 12—20 cm longus, 12—20 mm crassus; volva libera, 4—6 cm alta, 2.5—3.5 cm lata; sporae globosae, 9—12.5  $\mu$  diam.; basidia clavata, 39—57  $\mu$  long, 13—15  $\mu$  diam.; cellulae aciei lamellarum globosae, 15—45  $\mu$  diam.

Pileus plano-convex, margin sulcato-striate, nearly halfway the cap, 8—14 cm in diam., smooth, redbrown, paler near the margin.



Gills free, dirty white, 7—11 mm high in the middle. Flesh white, 5—8 mm thick near the stalk, rapidly thinning out near the margin. Stalk slender, hollow, dirty white, smooth, attenuated near the apex, 12—20 cm long, 12—20 mm broad in the middle, 8—12 mm near the top. Wall of stalk 2—3 mm broad. Volva free, large, 4—6 cm high, 2.5—3.5 cm broad. Basidia 4-spored, broadly clavate, 39—57  $\mu$  long, 13—15  $\mu$  broad near the top. Spores globose 9—12.5  $\mu$  in diam. Most common dimensions 9.5—11  $\mu$ . Cells on edge of gills globose, 15—45  $\mu$  in diam.

Sumatra: Batang Paloeboh ca. 1000 m, July 1924, E. Jacobson.

Only material in alcohol could be studied. On a superficial view one would identify our species with *A. fulva*. But on a closer examination that won't do. As I could ascertain on material of *A. fulva* collected by me in Holland this species is certainly quite different.

***Amanita ovalispora* Boedijn nov. spec.**

Pileus e campanulato expansus, glaber, margine striato-sulcatus, brunneus, 5—7 cm diam.; caro alba, tenuis; lamellae liberae, cremeae, 4—5 mm altae; stipes exannulatus, attenuatus, cavus, sordide albidus, primo squamulosus, deinde glaber, 9—11 cm longus, 10—12 mm crassus; volva libera, lobata, 2.5—3 cm alta, 1.5—2 cm lata; sporae ovoideae, 8—11  $\mu$   $\approx$  6—7  $\mu$ ; basidia clavata, 36—48  $\mu$   $\approx$  9—12  $\mu$ ; cellulae aciei lamellarum globosae vel subglobosae, 15—30  $\mu$  longae.

Pileus convex till plano-convex, margin sulcato-striate, nearly half way the cap, 5—7 cm in diam., smooth greyish brown. Flesh very thin, white, 1—2 mm thick near the stalk, rapidly thinning out near the margin. Gills free, cream colour, 4—5 mm high in the middle. Stalk hollow, dirty white, at first covered by small adpressed scales, especially near the base, soon becoming glabrous, attenuated near the apex, 9—11 cm long, 10—12 mm broad in the middle, 8—9 mm near the top. Wall of stalk about 2 mm broad. Volva free, sheathing the base of the stem, dirty white, with lobed margin, 2.5—3 cm high, 1.5—2 cm broad. Basidia 4-spored, clubshaped, 36—48  $\mu$  long, 9—12  $\mu$  broad near the top. Spores ovoid, 8—11  $\mu$   $\approx$  6—7. Most common dimensions 9—10  $\mu$   $\approx$  6—6.5  $\mu$ . Cells on edge of gills globose till subglobose 15—30  $\mu$  long.

Java: Bogor. Botanical Garden, III. 1925, v. Overeem.

*A. eriophora* Berk. seems a similar species, but the description is too vague to rely on.

Subgenus *Euamanita*—Pileus thin till subfleshy, margin sulcato-striate. Stipe annulate, hollow, not bulbous, with a free volva at the base. Spores ovoid till elliptic.

*Amanita hemibapha* Berk. et Br. Trans. Linn. Soc. London XXVII, 147, 1871.

Pileus pulvinate till plano-convex, often slightly subumbonate, margin sulcato-striate nearly halfway the cap, 6—8.5 cm in diam., smooth colour varying much, darkest in the centre, which is about antique brown, mais yellow, raw sienna, between orange and xanthine orange or yellow ocher, gradually changing into light cadmium, between apricot yellow and empire yellow, light orange yellow or deep chrome near the margin. Flesh dirty white 4—6 mm thick near the stalk, about 3 mm halfway the cap, gradually thinning out near the margin.

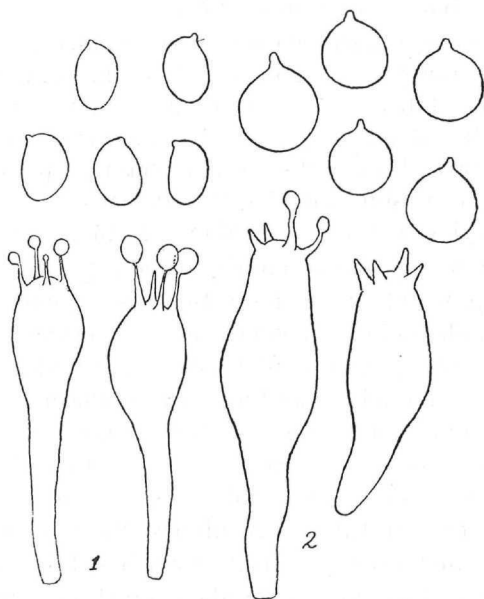


Fig. II. 1. *Amanita ovalispora*. — 2. *Amanita aporema*.

Gills free, yellow with orange-yellow edges, about empire yellow or between baryt yellow and Pinard yellow, 8—12 mm high in the middle. Stalk hollow, at first covered by adpressed scales, becoming glabrous, yellow, about between apricot yellow and empire yellow or between empire yellow and pinard yellow, above the ring the colour is about apricot yellow; scales orange buff; attenuated near the apex, 9—13 cm long, 10—14 mm broad in the middle, 8—11 mm near the top. Ring orange buff, situated about 2—3 cm from the apex of the stipe, dependent, lax, finely striate. Volva free, sheathing the base of the stem, dirty white, 2—5 cm high, 3—3.5 cm broad, wall up till 3 mm thick. Basidia 4-spored, clubshaped, 27—36  $\mu$  long, 8—10  $\mu$  broad near the top. Spores broadly elliptic, 8—12  $\mu$  long, 6—8  $\mu$  broad. Cells on edge of gills subglobose till elongated, filled with a yellow liquid, 43—57  $\mu$  long, 9—25  $\mu$  broad at the top.

Java: Tjibodas, XI. 1923 v. Overeem; IX. 1931 Boedijn; Poentjak pass, X. 1941 Boedijn.

This beautiful species is said to be related to *A. caesarea*. In fact our plant matches the pictures given by American authors pretty good. But those of European authors are showing a wholly different plant, with thick pileus, hardly striate at the margin and a thick solid stipe. Gilbert (2) therefore considers the American *A. caesarea* a distinct variety. I would even go farther, and interpret the American plant as a separate species.

***Amanita similis* Boedijn nov. spec.**

Pileus convexus, glaber, margine striato-sulcatus, centro obscure griseo-brunneus, margine melleus, 5—12 cm diam.; caro alba, tenuis; lamellae liberae, luteae, 14 mm altae; stipes cavus, attenuatus, sordide luteus, 10—15 cm longus, 8—16 mm cassus; annulus pendulus, griseus; volva libera, 2—3.5 cm diam.; sporae ellipsoideae,  $9.5-14 \rightleftharpoons 6.5-9 \mu$ ; basidia clavata,  $38-44 \rightleftharpoons 9.5-13 \mu$ ; cellulae aciei lamellarum subglobosae vel elongatae,  $12-24 \mu$  longae.

Pileus convex till plano-convex, margin sulcato-striate, nearly halfway the cap, 5—12 cm in diam. Surface smooth, seldom with a single white patch. Colour in centre greyish brown, about between Isabella color and light brownish olive, gradually changing into honey yellow till chamois near the margin. Flesh rather thin, dirty white, up till 5 mm thick near the stalk, rapidly thinning out near the margin. Gills free, pale yellow; seen from the edges about between mustard yellow and amber yellow, in face view about naphthalene yellow; up till 14 mm high in the middle. Stalk hollow, fibrillose, attenuated near the apex, greyish yellow, about chamois, brighter at base and top and there about mustard yellow: 10—15 cm long, 8—16 mm broad in the middle, 7—11 mm near the top. Wall of stalk 2—3 mm broad. Ring greyish, situated at about 2—3.5 cm from the apex of the stipe, dependent, lax. Volva free, grey, 2—3.5 cm in diam. Basidia 4-spored, clubshaped,  $38-44 \mu$  long,  $9.5-13 \mu$  broad at the top. Spores broadly elliptic,  $9.5-14 \rightleftharpoons 6.5-9 \mu$ . Most common dimensions  $10-12 \rightleftharpoons 7-8 \mu$ . Cells on edge of gills subglobose till elongated  $12-24 \mu$  long.

Java: Goenoeng Telaga (ca. 1650 m) 26. XI. 1939 v. Steenis.

In general appearance this species is close to the preceding. The colours however are very different.

**B. Spores amyloid.**

Subgenus *Amidella* — Pale coloured species, which are turning reddish when bruised. Margin striate. Stipe bulbous, annulate, with a free volva at the base. Spores ovoid till elliptic.

*Amanita volvata* Peck N.Y. State Mus. Rept. XXIV. 59, 1872.



Pileus convex, 8 cm in diam., sulcato-striate part of margin about 1 cm broad. Surface with adpressed thin scales; colour very pale yellowish brown about between pinkish buff and cream buff. Flesh thin, white, 2—3 mm thick near the stalk, rapidly thinning out near the margin. Gills free, dirty white, 5—6 mm high in the middle. Stalk white, floccose, becoming glabrous, attenuated near the apex, 11 cm long, 14 mm broad in the middle, 10 mm near the top. Base bulbous and surrounded by a lobed volva, 4 cm high, 3 cm broad. Basidia 4-spored, subclavate, 39—42  $\mu$  long, 7—8.5  $\mu$  broad at the

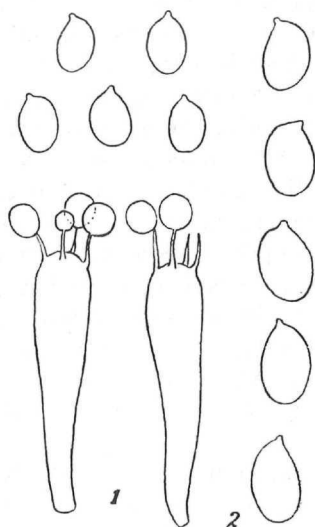


Fig. III. — 1. *Aminata volvata*. — 2. *Aminata similis*.

top. Spores oval till elliptic 7.5—9.5  $\mu$   $\Rightarrow$  5—6.5  $\mu$ . Most common dimensions 8—9  $\mu$   $\Rightarrow$  6  $\mu$ . Cells on edge of gills elliptic 21—33  $\mu$   $\Rightarrow$  9—12  $\mu$ . The whole fungus turning reddish when bruised, especially the gills, which are becoming about Congo pink.

Java: Poentjak pass, 7. VII. 1940. Boendijn.

Unfortunately only one carpophore was found, which did not show a ring. As rings in many species are very evanescent, this is of no great importance. Our species fairly agrees with the description of *A. volvata*, especially the discoloration is very striking.

Subgenus *Amanitina*. — Pileus subfleshy, till fleshy, smooth or with patches or warts. Stipe solid, annulate. Volva more or less strongly coalescent with the bulbous base, often only present as rings. Spores globose till somewhat elongated.

**Amanita Borneensis** Boedijn nov. spec.

Pileus fere globosus, dein convexus, margine appendiculatus, squamosus, roseo-brunneus non uniformiter coloratus, 6—9 cm diam. caro tenuis; lamellae liberae, sordide roseae, 4—6 mm altae; stipes floccoso-squamulosus, solidus, pileo concolor, 15—20 cm longus, 1.5—3 cm crassus; stipitis bulbus magnus, 4—5 cm crassus; volva floccosa; sporae globosae 7.5—11  $\mu$  diam.; basidia subclavata, 49—55  $\Rightarrow$  11—12.5  $\mu$ ; cellulae aciei lamellarum globosae vel subglobosae, 18—27  $\mu$  longae.

Pileus at first hemisphaerical, afterwards convex, margin not striate, 6—9 cm in diam., covered by adpressed scales, especially near the margin, which is sometimes appendiculate with remnants of the veil. Colour pinkish brown, unevenly distributed, about between russet vinaceous and sorghum brown. Flesh thin, dirty white, 2—5 mm thick near the stalk, rapidly thinning out near the margin. Gills free, pink, about buff pink or slightly paler, 4—6 mm high in the middle. Stalk solid, about same colour as pileus or somewhat paler, covered by coarse flocci, more or less arranged in rings near the base, which is abruptly bulbous; attenuated near the apex, 15—20 cm long, 1.5—3 cm broad near the base, 12—15 mm near the top. Bulbous part 4—5 cm broad. Volva circumcised and rudimentary. Basidia 4-spored, subclavate, 49—55  $\mu$  long, 11—12.5  $\mu$  broad near the top. Spores globose, 7.5—11  $\mu$  in diam. Most common dimensions 8—9  $\mu$  in diam. Cells on edge of gills globose till subglobose 18—27  $\mu$  long.

Borneo: Bt. Bidang Menabai ca. 700 m XII. 1924, H. Winkler.

In this material the margin of the pileus is sometimes appendiculate with the veil and no true ring could be observed. Nevertheless this certainly is an annulate species.

**Amanita neglecta** Boedijn nov. spec.

Pileus explanatus, primo squamosus deinde glaber, ad marginem striatus, griseo-brunneus, centro saepe obscurior, 4—11 cm diam.; caro alba, tenuis; lamellae liberae, albiae, 5—9 mm altae; stipes pallide brunneolus, squamulosus, 5—11 cm longus, 6—18 mm crassus; annulus membranaceus, luteus; stipitis bulbus parvus, 10—20 mm crassus; volva fugax; sporae globosae vel subglobosae, 6—8.5  $\mu$  longae; basidia clavata 30—36.5  $\Rightarrow$  8—9.5  $\mu$ ; cellulae aciei lamellarum globosae 12—30  $\mu$  diam.

Pileus at first hemisphaerical afterwards convex till appanate. Margin smooth or weakly striate over a short distance; 4—11 cm in diam.; covered by more or less angular warts 0.5—3 mm in diam., very crowded in the centre, becoming more or less glabrous in old age. Colour dirty brown about buffy brown, paler near the margin; warts darker. Flesh thin, white, 2.5—5 mm thick near the stalk,



rapidly thinning out near the margin. Gills free, dirty white till cream colour, 5—9 mm high in the middle. Stalk solid, becoming hollow in old age, pale coloured about pinkish buff or somewhat darker, covered below the ring by adpressed darker scales, indistinctly arranged in rings near the base, which is slightly bulbous; attenuated near the apex, 5—11 cm long, 6—10 mm broad in the middle, 5—12 mm near the top. Bulbous part 10—20 mm broad. Volva weakly circumcised, scaly, fugacious. Ring pale yellow, about colonial buff, dependent, lax. Basidia 4-spored clubshaped 30—36.5  $\mu$

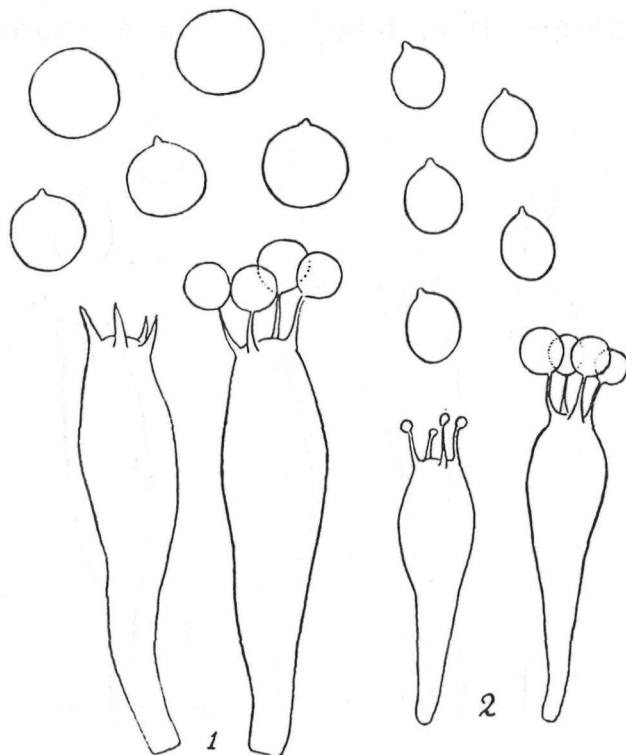


Fig. IV. — 1. *Amanita Borneensis*. — 2. *Amanita neglecta*.

long, 8—9.5  $\mu$  broad near the top. Spores globose till subglobose, 6—8.5  $\mu$  long. Most common dimensions 6.5—7  $\mu$ . Cells on edge of gills globose, 12—30  $\mu$  in diam.

J a v a: Bogor, VIII. 1921, v. Overeem; Tjibodas XI. 1923, v. Overeem; Poentjak pass 21. IV. 1940, Boedijn.

*A. fritillaria* Berk. may be a related or even the same species, but the description is insufficient.

***Amanita tjibodensis* Boedijn nov. spec.**

Pileus convexus, fragmentis volvae obtectus vel glaber, albidus, 6—13 cm diam.; caro alba; lamellae liberae, cremeae, 5—10 mm altae; stipes solidus, deinde cavus, albidus, 10—20 cm longus, 12—25 mm crassus, basi bulbosus 2.5—4 cm crassus; volva adnata, semilibera; sporae globosae vel subglobosae, 6—9  $\mu$  longae; Basidia

clavata 40—48  $\Rightarrow$  8—9.5  $\mu$ ; cellulae aciei lamellarum globosae vel elongatae 12—39  $\mu$  longae.

Pileus convex, slightly viscid, glabrous or sometimes covered by a few large patches 6—13 cm in diam., white. Flesh white 4—8 mm thick near the stalk, rapidly thinning out near the margin. Gills free, pale, about cartridge buff, 5—10 mm high in the middle. Stalk white, solid, becoming hollow in old age, covered by small adpressed scales, rapidly becoming glabrous, hardly attenuated near the apex, 10—20 cm long, 12—25 mm broad in the middle, base bulbous 2.5—4 cm broad. Ring fugacious. Volva coalescent with the bulbous base, margin free, lobed. Basidia 4 spored, clubshaped,

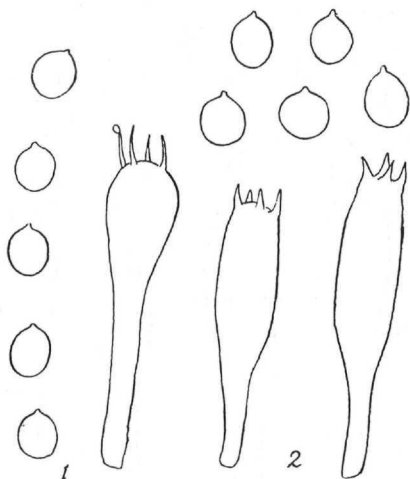


Fig. V. — 1. *Amanita sumatrensis*. — 2. *Amanita tjibodensis*.

40—48  $\mu$  long, 8—9.5  $\mu$  broad near the top. Spores globose till subglobose 6—9  $\mu$  long. Most common dimensions 7—8  $\mu$ . Cells on edge of gills globose till subglobose 12—39  $\mu$  long.

Java. Tjibodas, without date Bruggeman; 13. VI. 1940 T o x o p e u s.

Subgenus *Aspidella*. — Pileus fleshy, white, often turning pale yellowish or greenish; covered by warts. Stipe solid, annulate, bulbous at the base. Volva rudimentary. Spores ovoid till elliptic.

***Amanita sumatrensis* Boedijn nov. spec.**

Pileus convexus, margine appendiculatus, verrucis pyramidalibus dense obtectus, albidus vel pallide cremeus, 10—13 cm diam.; caro bene evoluta alba; lamellae liberae, albae, 10—12 mm altae; stipes dense verrucosus, solidus, dein cavus, albidus 10—12 cm longus, 2 cm crassus; stipitis bulbus 4—5 cm crassus; volva fugax; sporae

subglobose vel elongatae, 6—9  $\mu$  longae; basidia clavata, 36—48.5  $\mu$  longae; cellulae aciei lamellarum globosae vel subglobose, 12—27  $\mu$  longae.

Pileus convex, 10—13 cm in diam., covered by pyramidal warts up till 4 mm long, 1—2 mm broad at the base, very crowded in the centre. The warts diminishing in size near the margin, partly disappearing in old specimens, leaving a distinct scar. Margin appendiculate with remnants of the veil. Colour white till pale cream. Flesh well developed, white 8—10 mm thick near the stalk, gradually thinning out near the margin. Gills free, white, 10—12 mm high in the middle. Stalk stout, not attenuated near the apex, solid, becoming hollow in old age, same colour as pileus, wholly covered by small warts, which are easily detached, base strongly bulbous; 10—12 cm long, 2 cm broad, bulbous base, 4—5 cm in diam. Ring fugacious. Volva only as small remnants at the top of the bulbous base. Basidia 4 spored, clubshaped, 36—48.5  $\mu$  long, 9—11  $\mu$  broad near the top. Spores subglobose till elongated 6—9  $\mu$  long. Most common dimension 7  $\mu$ . Cells on edge of gills globose till subglobose, 12—27  $\mu$  long.

Sumatra. Batang Paloepoeh VII. 1924 E. Jacobson; Palembang, Talang Betoetoe 12. XI. 1939 van't Woudt.

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3. — Notules sur les Amanites suppl. Paris 1941, 23 pp. 1 pl. 1 Fig.



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