SUILLUS BELLINII FROM MAJORCA

ROY WATLING

Good material of a bolete which is undoubtedly the same as *Boletus bellinii* Inz. was passed onto me for my comment by Professor A. H. Smith to whom I am most grateful.

The description below of the fungus from the Balearic Islands is based on the field notes of Gruhzit and a personal microscopic examination.

Pileus up to 125 mm in diameter, semiglobate at first with margins slightly inrolled, then becoming convex-expanded, finally flattened with the margin becoming upturned, variable, at first greyish or dirty white then yellowish brown or even reddish brown, viscid, particularly when moist and when immature, then becoming dry and shiny, pellicle being removable in toto. *Stipe* solid, firm, relatively short for the size of the pileus, up to 75 mm long × 12–20 mm thick, straight, rarely equal, swollen in the lower part but then rapidly terminating in a point which is connected to a root-like system, white to slightly yellowish at first then becoming flushed coffee brown particularly towards the base, upper third ornamented with salmon brownish glandular dots which darken with age. *Flesh* white in major areas but in young carpophores yellow in the apical part of the stipe and adjoining tissue of the pileus and above the tubes; base of stipe and main areas of pileus not discolouring and not changing colour even after the pellicle has been torn from the tissue. *Tubes* adnate to slightly decurrent, up to 10 mm long unchanging on bruising, watery yellowish with a faint greenish (bluish) tinge. *Pores* relatively small, up to 4 mm, triangular, light yellow at first but gradually becoming darker almost bronze due to a secretion from the glandulae at the tube orifices. The excrescence often stains the paper when the spore-print is taken and gives a rusty aspect to the spore-print. The actual spores in mass are cinnamon brown (clay brown of Pearson).

Basidia 4-spored, 17–20 × 5–7 μ, clavate, hyaline in KOH and pale yellowish in Melzer's solution; *basidiospores* 6·5–8 × 3·5–4 μ, hyaline to pale ochraceous in KOH although with a few that are more strongly coloured in damaged areas of hymenium, thin-walled, subellipsoid slightly inequilateral in profile view, yellowish in Melzer's solution. *Pleurocystidia* in scattered groups with yellow-brown to red-brown encrusted material around the base or to half way up, individual cystidia 35–45 × 6–8 μ, clavate, hyaline or with yellowish or brownish contents; *cheilocystidia* similar to pleurocystidia but forming a very distinct fringe at the tube orifices and far more variable than pleurocystidia, up to 50 μ long and 10 μ wide, frequently with very dark red brown contents. *Hymenophoral trama* consisting of gelatinised, slightly curved hyphae faintly diverging from a thin central strand. *Pileus* '*cuticle*' of narrow, gelatinised filaments with brownish contents, 2–5 μ wide, and forming a tangled ixotrichoderm; *pileus trama* of homogeneous, interwoven hyaline hyphae. Stipe with numerous fascicles of caulocystidia over surface; *caulocystidia* clavate, subfusoid or cylindric and with coloured contents as in cheilocystidia, more rarely hyaline and usually with encrusting material

about the base, frequently intermixed with dermatobasidia. *Clamp-connections* not seen.

Under or in the vicinity of 2-needled pines (species not given but suspected to be *Pinus halepensis* and/or *P. pinaster*; the latter is frequently planted). In undulating country, hilly ridges of sandy gravel overlying limestone; pines intermixed with *Quercus* sp. and several evergreen shrubs. 4–5 xi 1961. Palma, Mallorca.

There is some confusion as to the correct name for this fungus even though it is well described and figured by Inzenga. Generally *B. bellinii* is synonymised with *B. boudieri* a bolete well illustrated in Bresadola (1931) on plate 908. The latter was first described by Quélet in 1878 based on material collected near Menton by E. Boudier. It was later collected in Nice (Quélet, 1888 under the name *Ixocomus boudieri* (Quél.) Quél.).

Differences exist between the original plates of these two species and their accompanying descriptions. From the results obtained after examining dried material I do not consider them so closely related; *B. bellinii* is distinguished by the large size, rooting habit, distinctive pileus colours which commence greyish but soon become quite dark, stipe distinctly pale in colour, flushed yellow and then coffee brown and although glandular lacking bright red glands.

B. bellinii was published either late in 1877 or more probably very early in 1878 (Society communication accepted Sept. 22nd 1876) whereas *B. boudieri* could not have appeared until very late in 1878 and more probably in early 1879 (Quélet's report is in the December sessional report). *B. bellinii* was however redescribed in Funghi Siciliana II (1879) and this is the description usually referred to by authors, including Quélet who then argued that his name had priority. Pearson (1950) discussed the nomenclatural problems associated with this fungus in connection with his finding of *B. bellinii* in Cape Province, S. Africa, and correctly pointed out that the epithet *leptopus* attributable to Persoon cannot be used because it was originally part of a trinomial associated with *Boletus circinans*, a fungus now considered a synonym of *Suillus granulatus*. The material collected by Pearson has been examined and agrees in every way with the Gruhzit material. Singer (1945) considers *B. bellinii*, under the name *leptopus*, a subspecies of the cosmopolitan *S. granulatus*, a fungus which is common in the British Isles, particularly Scotland, growing under Scots Pine (*Pinus sylvestris*). Similarly Blum (1965), whose recent account only goes part way to unravelling the complexities of the European members of *Suillus* subsect. *Angustiporini*, considers it a variety of *S. granulatus*. Blum, however, has a rather wider species concept than the present author. It is very possible that the fungus Singer refers to when speaking of the Mediterranean race of *S. granulatus* is really one of the many other varieties defined by Blum and his colleagues (1965) and neither the true *B. bellinii* nor *B. boudieri*. In my account of *Suillus* (1965) I wrongly cited the fungus discussed above as *Suillus leptopus* (Pers.) Singer instead of *S. granulatus* subsp. *leptopus* (Pers) Singer or as it is often cited *Ixocomus leptopus* (Pers.) Gilbert. By some *Ix. leptopus* is considered an infraspecific taxon of *S. placidus*; Kallenbach (1926) and Konrad 1928) are two such authorities, the former even erecting a special form to accommodate it i.e. *S. placidus* f. *pini-halepensis*. Comparison of the original descriptions alone

shows this placing to be incorrect and the fact is further supported by examination of fresh collections and herbarium material. Although recorded from Europe *S. placidus* is native to North America growing scattered under *Pinus strobus*, a 5-needled pine*; it is much more slender than *Ix. leptopus* as well as also being differently coloured and superficially similar in this latter character to *B. boudieri* as figured by Bresadola (1931). *S. placidus* has probably been introduced into Europe through the planting of exotic conifers; it has not as yet been recorded from the British Isles.

Variation in *S. granulatus* does not appear to be very great in collections from the British Isles and material examined from localities in England and Scotland agrees in all important points with Swedish collections. Smith & Thiers (1963) have already discussed *S. granulatus* subspecies *snellii*, a North American taxon, thought to be parallel to subsp. *leptopus* in the Mediterranean.

After making several collections of so-called *S. granulatus* in Mid-West America and having examined considerably more from all over N. America I am unable either to detect reasons for considering this taxon conspecific with *S. placidus* or to detect any major differences between it and the European form. There are however several quite separate although very close species which Smith and his colleagues would place in the same stirps. The veil is a critical character and on no young or mature specimens of *S. granulatus* from W Europe examined have velar remnants been observed; fugaceous veil material was seen neither on the collection of *B. bellinii* from Majorca nor on the herbarium collections examined.

B. bellinii must be considered an autonomous species distinct from *B. boudieri* and quite separate from, although related to, *S. granulatus* and *S. placidus*. René Maire made the transfer of Inzenga's fungus to *Ixocomus* in an attempt at a more natural classification of the boletes; *Ixocomus* was then the accepted genus for *S. luteus*, *S. granulatus* and their allies. However, it has now been shown on several occasions that *Suillus* is the legitimate name; the following new combinations are therefore proposed:—

Suillus bellinii (Inzenga) Watling **comb. nov.**

Basionym: *Boletus bellinii* Inzenga in Atti. Acad. Gioen. Catania 12: 111–113 (1878)†.

The synonymy etc. can be summarised as follows:—

Ixocomus bellinii (Inz.) Maire, 1931.

I. placidus var. *bellinii* (Inz.) Konrad, 1928.

I. placidus f. *pini-halepensis* Kallenbach, 1926.

Boletus circinans leptopus Persoon, 1825.

as *Boletus granulatus* var. *leptopus* (Pers.) Blum in Bull. Soc. mycol. Fr. 81: 485 (1965).

as *Suillus granulatus* subspecies *leptopus* (Pers.) Singer in Farlowia 2: 272 (1945).

* *placidus* is the epithet given to this fungus by Bonorden (1861) when he first described it from Europe. Peck (1873) described the same fungus from what it is now known to be its native area under the name *B. albus* although over ten years later. Thus it is of interest to note this fungus was first described from introduced not indigenous material.

† Not 1861 as stated by Pearson (1950) and not 1869 or 1861 as stated by Singer (1938).

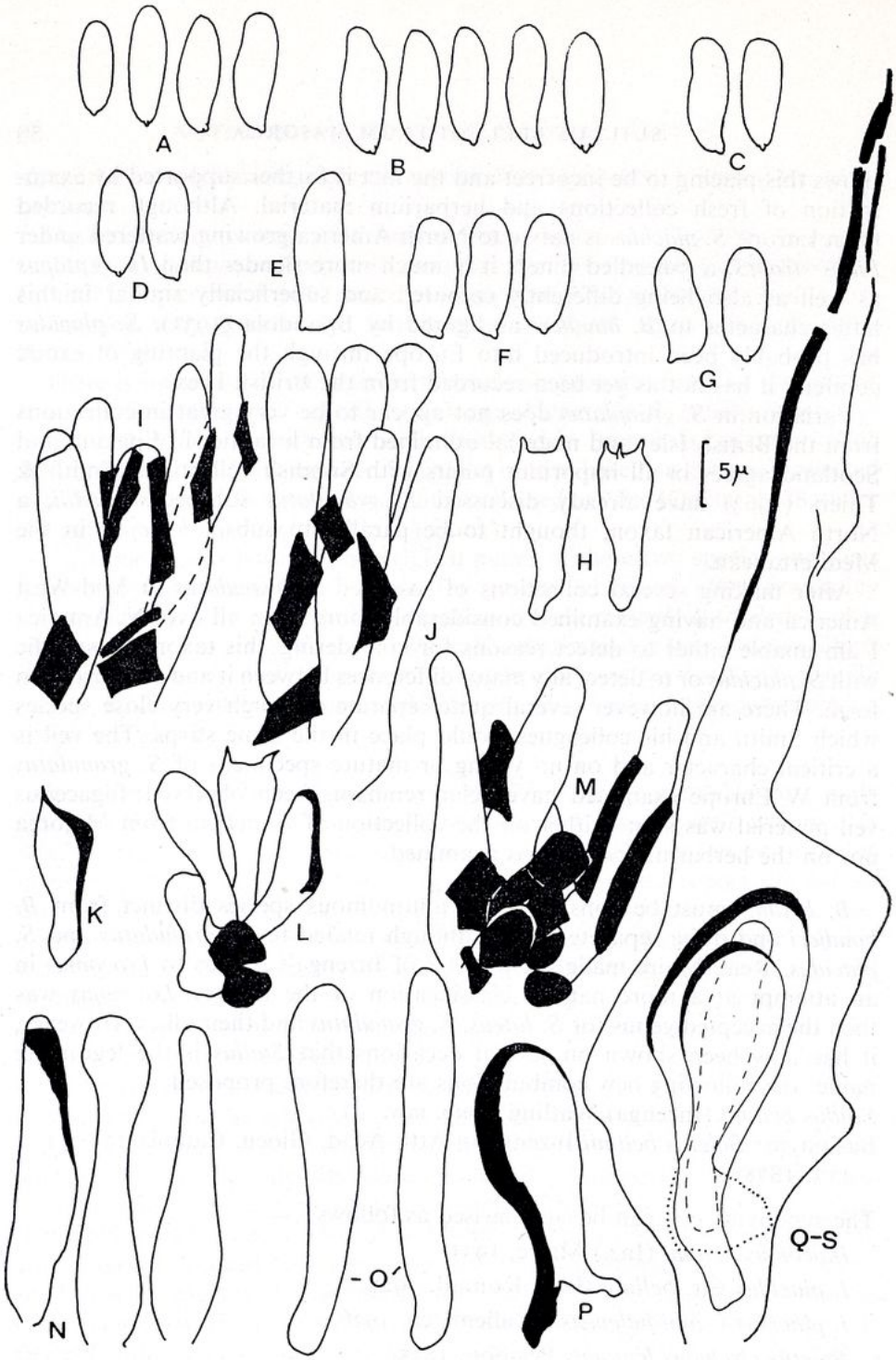

FIG. 5. *Suillus bellinii* and related taxa (black indicates the dark brown amorphous material which coats the 'gland' cells).

A and H, J–P inclusive *Suillus bellinii*: Coll. Gruhzit, Palma (Watling A 1532/C1794) A. basidiospores, H. basidia, J. group of cheilocystidia, K. monosporic basidium from stipe 'gland', L. group of caulocystidia and dermatobasidia, M. group of cheilocystidia, N. caulocystidia, O. cheilocystidia, P. cheilocystidia covered completely in dark brown exudate; B–D *Suillus bellinii*, B. basidiospores from type (K), C. basidiospores, Dennis Portugal (K), D. basidiospores Pearson S Africa (K); E. sketch of basiodispores of *B. granulatus* var. *boudieri* s. Blum; F. basidiospores of *S. boudieri* Nathan Cyprus (K); G. Roumeguère exs. 3822 (K) = *B. granulatus* var. *leptopus* s. Blum?; I. *S. bellinii* group of caulocystidia from type (K); Q–S. *S. bellinii* outline of three caulocystidia superimposed showing how they become progressively covered in exudate, Pearson S. Africa (K).

as *Ixocomus leptopus* (Pers.) Gilbert in Les Bolets, Paris (1931).

Boletus boudieri auct. pl. non Quélet, 1898.

? *Boletus collinitus* Fr. pro parte.

Suillus boudieri (Quelet) Watling **comb. nov.**

Basionym: *Boletus boudieri* Quélet in Bull. Soc. bot. Fr. 25: 289 (1879).

S. boudieri is characterised particularly by the ivory white colours and the bright red to carmine glandular dots on the stipe.

The collecting of *Suillus bellinii* from this part of the Mediterranean not only constitutes a new record but is of particular interest because Gruhzit's material is accompanied by copious notes pertaining particularly to the so-called toxic properties of the fresh carpophore. It is this European collection that Smith and Thiers (1963) mention in their monograph of North American *Suillus* spp. although they state that in the United States and Candaa no cases of poisoning have been clearly attributable to the eating of species of *Suillus*. Poisonings due to this group of fungi have not been recorded from the British Isles, nor from Continental Europe, as far as can be judged from the literature. *S. bovinus* and *S. variegatus*, two boletes common in Britain but for which there are no convincing records available from North America, are both edible with a rather good taste, although certainly inferior in quality to *Lepiota* spp. and *Agaricus* spp. The third European species of this genus not recorded as yet from N America is *S. tridentinus* and this is also reputed to be edible. Carpophores of *S. luteus* and *S. granulatus* are frequently eaten on the continent and in 'Mushrooms' (1954) Pilat records that *Boletinus cavipes* and several *Suillus* spp.—*S. bovinus* (as *Ixocomus bovinus*), *S. grevillei* (as *I. elegans*) and *S. aeruginascens* (as *I. viscidus*)—are also eaten in Eastern Europe.

Further observations and enquiries, preferably on the spot, are required to clear up the point as to the edibility of *Suillus bellinii* particularly as many very closely related fungi are sought after as delicacies. Conversation with persons familiar with the idiosyncrasies of the Spanish peasant suggest that it is not really surprising that a perfectly good edible food is rejected because of one of the many peasant superstitions (cf. fish-eating habits of certain coastal peoples of the world).

Material examined (K):—

Boletus bellinii Inz. Roumeguère Fungi select. exs. No. 5327: Sous les pins aux environs de Palmere 1883; Type Inzenga (K.).

as *B. bellinii* Inz. Cape Town, vi 1948, A. A. Pearson.

as *B. bellinii* Inz. School of Agriculture, Lisbon 29 x 1955, R. W. G. Dennis.

Suillus boudieri:

as *Boletus boudieri* Quél. Roumeguère Fungi select. exs. No. 3822, Alpes-Maritimes: Region montagnes, Bere, Dec. 1884, Barla.

as *B. boudieri* Quél. under pine, Cyprus, March 1932 R. M. Nathan No. 9 accompanied by photographs.

Also the following collections which have been examined in the fresh condition (E).

Suillus granulatus (Fr.) Kuntze: Emmet Co. 11 vii Watling A 92/C2173; Sugar Island. Chippewa Co. 21 vii A 1673/C1997 and A 1678/C2003; Sugar Island, Chippewa Co. 27 vii A 179/C2038; Culhane Lake, Luce Co. 6 viii A 1883/C2311; Pellston, Cheboygan Co. 21 viii A 1887/2318; Carp Creek, Emmet Co. 22 viii A 1722/C2034 and A 1902/C2331 (all from Michigan U.S.A., 1965): Jackson State Forest, California, 27 x 1962, legit H. Thiers, Watling A 2164/C2580.

Under *Pinus sylvestris* Malham, Yorkshire, British Isles 30 viii 1961 Watling 238C; Round Wood, Malham, Yorkshire 5 ix 1961 Watling 391C; Malham, Yorkshire 31 viii 1958 Henderson 4156.

S. placidus (Bon.) Singer: Emmet Co. near Pellston 4 vii Watling A 1683/C 2011; University Biological Station, Cheboygan Co. 19 vii A 1800/C2191; Sugar Island, Chippewa Co. 21 vii A 1715/C2051; Sugar Island, Chippewa Co. 25 vii A 1754/C2119; Sugar Island, Chippewa Co. 27 vii A 178/C2113; Tahquamenon, Luce Co. 12 viii A 1730/C2076 (all from Michigan U.S.A. 1965).

S. albidipes (Peck) Singer; Tahquamenon, Luce Co. 12 viii Watling A 270/ C2061; University Biological Station 22 viii A 377/C2037 (both from Michigan U.S.A. 1965).

S. brevipes (Peck) Kuntze; Tahquamenon, Luce Co., Michigan, U.S.A. 2 viii 1965 Watling A 1848/C2263; Sugar Island, Chippewa Co., Michigan U.S.A. 14 viii 1965 A 282/C2038; Jackson State Park, California 27 x 1962 legit H. Thiers Watling A 3237/C2555 (also several collections of var. *gracilis* Smith and Thiers from Michigan, U.S.A. 1965, Watling A 434/C2094 and A 1759/C2126 and A 1784/C2166).

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