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The Taxonomy of Polyporus mollissimus

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(With 2 Figures).

In a series of polypore specimens received for naming from the herbarium of the University of California at Berkeley was an unusual one from Guam for which the junior author, who had under study a similar specimen from Japan, suggested the name Spongipellis stramineus Pat. Specimens in the National Fungus Collections and published records indicated some confusion as to the status of this species and possibly synonymous species such as Polyporus mollissimus and others. Available material under these two binomials was obtained on loan from the Patouillard collection of the Farlow Herbarium, Harvard University. With this additional series of specimens at hand a critical study was made of the taxonomic problem involved.

Polyporus (Spongipellis) mollissimus was described by Patouillard (8, p. 340) in 1897 from a collection (No. 5866) made by P. Bon at the base of trunks of *Euphoria longana* at Lang Nhôi, Prov. of Thank Hòa, Tonkin, in 1893. He described the macroscopic characters adequately, noting particularly the pure white color, turning dull yellow or "wood color" on drying, the extreme softness of the basidiocarp, and the character of the pores. He found the spores colorless, ovoid, smooth, $10 \times 6 \mu$, one-gutulate.

Saccardo and Sydow (16, p. 180) accepted the species repeating most of Patouillard's description in their Latin diagnosis. They gave the substrate as *Euphorbia longana* in error for *Euphoria (Nephelium) longana* of the *Sapindaceae*. Patouillard's suggestion that the species might be placed in his own genus *Spongipellis*, a segregate from *Polyporus*, made by placing the name in parenthesis after *Polyporus*, was of course ignored.

C. G. Lloyd was not familiar with the species, which is strange

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considering the time he spent studying the larger fungi at Paris. He dismissed the species (4, p. 382) with the brief comment, "China, P atouillard, unknown to me. Compared to *P. spumeus.*"

Specimens under this name available for study in addition to the type already noted included three others so named by Patouillard from Tonkin which had been collected by Duport and Petelot in 1913—14 and 1921. Japanese material consisted of two specimens from Hokkaido Collected in 1957 on *Acer mono* by Y. Yok at a and in 1959 on *Populus* by K. Aoshima. Finally we had a large and excellent specimen collected "at the base of a living tree" by Reid Moran (4585) near Tailalo, Guam, in 1954.

A study of this material indicated a clear-cut species conforming very well to Pattouillard's description, particularly as far as macroscopic characters were concerned. Some details of the microscopic structure were overlooked or misinterpreted by him as will be discussed later.

Hariot and Patouillard (2, p. 9—10) described Xanthochrous bernieri in 1903 from material collected on rotten tree trunks in New Caledonia by Bernier (No. 1122) in 1901. The species was transferred to Polyporus by Saccardo and D. Saccardo (17, p. 110) in 1905. The salient characters of the original description were used in their Latin diagnosis. Hariot and Patouillard emphasized macroscopic characters practically identical with those of *P. mollisimus*. Microscopic characters, including spores, insofar as included differed in no respects.

There were available for study under this name three specimens in the C. G. Lloyd herbarium labelled "ex type" or "co-type". All were presumably part of Bernier's original specimen, No. 1122. Two of the Lloyd specimens were fragmentary, but the third was ample for study, which indicated that *P. bernieri* differed in no way macroscopically or microscopically from *P. mollissimus*.

L loy d (4, p. 354) gave a brief, but fairly accurate, macroscopic description of his "co-type" specimen (48018) and noted the presence of abundant, smooth, pale-colored spores, $6-7 \times 8-10 \mu$. He added, "It is noteworthy for its light weight and color."

It is difficult to understand why Patouillard and his coauthor assigned the species to *Xanthochrous* which he had himself erected a few years earlier. Although emended to varying degree and with differing concepts by Bourdot and Galzin, Murrill, Pinto-Lopez, and perhaps others, it has in general always included stipitate species with deep brown context, a complex for which the species under discussion definitely does not qualify.

Under the binomial *Spongipellis stramineus* Patouillard (9) in 1908 described a species as new from material collected by Le Rat /erlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.



Fig. 1. A. Polyporus mollissimus Pat. Upper surface of basidiocarp — (Guam specimen). \times I — B. Same. Lower surface. \times I.

in New Caledonia. The description is brief, but the salient characters listed are clearly those of *P. mollissimus*, including color and nature of the basidiocarp, the pores, and above all the spores. P at ouillard follows his formal description with a page of discussion on the structure of the basidiocarp which serves to emphasize the fact that *P. mollissimus* is in fact involved. His illustrations of the basidiocarp are typical.

Saccardo and Trotter (18, p. 226) in 1912 transferred the species to *Polyporus*, repeating essentially in their Latin diagnosis Patouillard's description.

P at o u i l l ar d again discussed his species in his second paper on C. F. B a k er's Philippine collections (10, p. 92), citing a specimen collected by the latter (No. 2134) on rotten tree trunks on the slopes of Mt. Maquiling, Laguna Prov., Philippine Islands. Surprisingly he cited his earlier species, *P. mollissimus*, as a synonym giving as its authority "Pat. ap. Morot" and adding "formé résupinée". It is not evident why Morot, as "Director" of the Journal de Botanique, should be brought into the situation nor why the species should be referred to as a resupinate form. P at o u i l l ar d's type of *P. mollissimus* is not resupinate. In his discussion he noted that in none of the specimens examined by him (New Caledonia, Tonkin and Philippine Islands) had he found basidia and added that the inner surfaces of the pores are lined with a layer of conidiophores resembling those of *Daedalea biennis* and that the spores noted were conidia.

It is true as Overholts (7, p. 224—6) pointed out that more or less globose chlamydospores are often present in distorted forms of *Polyporus (Daedalea) biennis* and that a ptychogastric form in Europe, *Ceriomyces terrestris* Schulzer, has no external pores but is divided into lacunae in which conidia identical with the chlamydospores just mentioned are produced. This is definitely not the case with the species under study, which produces normal basidia. The spores nearly always pressent in profusion are true basidiospores and there has been no evidence in the series of specimens studied by us of an abnormal *Ptychogaster* or *Ceriomyces* form.

L l o y d (6, pp. 8, 16) received a specimen in 1919 from T. P et c h (No. 4992), Peradeniya, Ceylon, which he referred to this species under the binomial, *Trametes straminea*, thereby in effect setting up a new combination. He commented as follows: "This is a most peculiar plant, well named straw color. It is very light in weight, of loose texture, and uniform colour. The large angular pores are distinctly stratose (as they are in the type), but no one could consider it a *Fomes*. The abundant spores are large, $8 \times 10 \mu$, smooth, and very pale coloured. For me it is a *Trametes* in the same section as *T. hispida*, with the same light texture and same surface." P et ch (12,

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p. 287) listed the species in one of his lists of Ceylon fungi without comment, other than that the determination was by $L \log y d$.

Teodoro (20, p. 338) included the species in his work on Philippine fungi as *Polyporus stramineus* (Pat.) Sacc. & Trott., citing two specimens collected by Baker (Nos. 2133, 2134) on the slopes of Mt. Maquiling. The latter is part of the collection discussed by Patouillard in his Philippine paper. Teodoro did not discuss the species.

Lloyd doubtfully named a specimen sent to him by the Rev. J. Rick from Brasil as *Trametes straminea*. Rick in two of his papers (13, p. 32, 14, p. 157) listed the name without comment, erroneously attributing the species to M. C. Cooke in the second. Actually the specimen as deposited in the Lloyd herbarium, National Fungus Collections (Lloyd no. 48276) differs greatly from *P. mollissimus*. It is zonate, appressed strigose, with dark-brown firm contex and light-brown pores. It has hyaline, long ovoid, non-guttulate spores $3-5 \times 9-11 \mu$. This is a misidentification which need not be further considered here.

Four specimens under this name (S. stramineus) from the P atouillard herbarium were studied in addition to the Philippine specimens already discussed. Three of these were collections by L c R at made in 1907 and 1909 in New Caledonia. The most important of these was an abundant, but unnumberred collection which fits P at ouillard's description and illustrations very well. It has been considered the type or perhaps the lectotype inasmuch as P at ouillard did not actually designate a type. The two other Le Rat collections (Nos. 94, 117) were typical in all respects, but fragmentary.

P at o uillard also recived a specimen collected by B uisson (No. 65) in "Haut Katanga", Belgian Congo, in 1923 which he labelled "Spongipellis stramineus var. africanus (Ptychogaster)." The specimen was typical of other specimens examined in the course of this study. There was no evidence of a Ptychogaster stage or other abnormalities. Presumably P at oillard, having decided that the abundant spores here present as usual were conidia, necessarily had to consider the specimen abnormal (a Ptychogaster form). No reason was noted for a varietal designation other than geographical and the present authors leave the varietal suggestion as an herbarium name.

Lloy d (5, p. 630) used the binomial *Poria xylina* for a specimen received from A. Y as u da, collected in Formosa in 1916. Y as u da later (24, p. 49) credited the name to Lloy d as did Stevenson and Cash (19, p. 141) in their list of Lloy d's new taxa. K. Hara (1), however, in the third and fourth editions of his List of Japanese Fungi, pp. 303 and 284 respectively, credited the species to Y as u da, obviously in error. Lloy d's description was indefinite and meager

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Fig. 2. Polyporus mollissimus Pat. Cross section of basidiocarp — (Guam specimen). \times I.

enough, but Yaseda gave none at all. Saccardo Sylloge Fungorum) and Ito (Mycological Flora of Japan) ignored the name.

L l o y d described his species as "pure white, soft cottony, with broad, soft margins, hyphae hyaline, loosely woven; pores large, angular; cystidia none; spores abundant, ellipsoid, $6 \times 8\mu$, hyaline, 1 -guttulate. This is not a European nor American species, probably not named. The specimen is resupinate, hence a *Poria*, but it has a nodular effect as though it might develop a pileus." Examination of the type specimen (No. 8557) in the Lloyd herbarium confirmed Lloyd's findings as far as they go, but indicated clearly that the specimen must be assigned to *Polyporus mollissimus*. Except for its pseudo-resupinate condition it differs in no way from other specimens examined.

A specimen in the National Fungus Collections found growing from a wound of a living tree of *Cinnamonum camphora* by A. H a f i z K h a n at Dehra Dun, India, in 1923 and distributed as No. 15 of the Forest Research Institute was studied by B r e s a d ol a. He noted that it was unknown to him and was related to *Polyporus obtusus* Berk. or *P. obliquus* Fr. and should perhaps be considered as an abnormal form of *Polyporus funalis* Fr. This latter species, better known as *P. leoninus* Kl., is characterized by a thick mat of darkbrown fibers constituting the pileus with practically no context. In this and its other described characters it obviously differs markedly from *P. mollissimus*. B r e s a d o l a's notes accompanying the specimen, on the other hand, are directly descriptive of *P. mollissimus* including his sketch of typical 1-guttulate spores, said to be $8-40 \times 6-7 \mu$. Our examination confirms the decision that this Indian specimen can be so referred.

A specimen collected by T. Petch in Ceylon (No. 3551) was referred by $L \log d$ to *Polyporus obtusus* Berk. Petch (11, p. 32) included the $L \log d$ determination in his list of Ceylon polypores without comment. $L \log d$ (4, pp. 4, 6). however, said "The finding of this plant in Ceylon is quite remarkable. It is frequent in the United States, but this is the first specimen from the East." He noted the abundant, hyaline, smooth, 1-guttulate spores and surprisingly enough "wart-like projections from the hymenium." Patouillard had at all times overlooked hymenial elements. Our own study of this Ceylon specimen ($L \log d$ No. 34925) found it typical in all respects of *P. molissimus*. It is hardly necessary to add that it differs from the temperate species, *P. obtusus*, in many characters, including consistency of texture, color, lack of clamp connections, character of spores, and hymenial elements.

From the preceding data it appears evident to us that the material studied can all be referred to one species occurring in widely separated countries of Africa and the Orient, and apparently only in tropical or subtropical areas. The earliest applicable binomial available is *Polyporus mollissimus* Pat., which is used here. The junior author prefers the genus *Spongipellis* Pat., which is of course a valid genus for those who prefer to beak up the Friesian genus *Polyporus*, considering it unwieldy and too heterogeneous in its complexity for present-day usage. The senior author obviously prefers a conservative approach to the nomenclatorial problem involved and awaits a definitive and usable plan for breaking up *Polyporus* which will be generally adopted by all interested in the genus. Finally it should be noted that a new combination will be necessary if *Spongipellis* is to be used. A formal presentation of the nomenclature of the species and an amended description follows.

- Polyporus mollissimus Pat. Jour. de Bot. 11: 340. 1897. Xanthochrus bernieri Har. et Pat. Jour. de Bot. 17:9-10. 1903, Polyporus bernieri (Har. et Pat.) Sacc. et. D. Sacc. 17:110. 1905. Spongipellis stramineus Pat. Bull. Soc. Myc. France 24: 166-167. 1. fig. 1908.
 - Polyporus stramineus (Pat.) Sacc. et Trott. Syll. Fungi. 21: 266, 1912.

Poria xylina Lloyd Myc. Writ. 5: 630. 1917.

Trametes stramineus (Pat.) Lloyd Myc. Writ. 5: L. 69: 13. 1919.

Basidiocarps sessile to almost entirely resupinate, dimidiate to irregular, often imbricate, variable in size and thickness, up to 15 cm. long, 5-10 cm, in depth and 1-8 cm, in thickness, soft and watery when fresh, drying soft and spongy, strikingly light in weight, white when fresh, becoming uniformly straw colored (stramineus) to yellow on drving [capucine buff to pale vellow-orange of Ridgway (15)], at times dull brown with age, non-zonate, densely tomentose, consisting of coarse fascicles, matting down in age or wearing away to a greater or lesser extent; margins rounded in dimidiate specimens; context almost negligible in resupinate forms to 2 cm. thick, very soft and spongy when dry, concolorous with pores; pores extending to edge, variable, rounded to angular to labyrinthine in resup. condition, thin walled, fimbriate, .5 to 2 mm. in diameter, occasionally stratose, up to 2 cm. long merging irregularly into the context, thin to thickwalled, septate, branched, 2.5–5.5 μ in diam., hyphal fusions occuring to produce hyphal fascicles; hymenial elements varied consisting of (1) acuminate basidioles, 5-7 µ diam., 30-35 µ long and usually protruding little or none beyond hymenial surface, (2) essentially non-encrusted, thin-walled, non-septate, or rarely so, hyaline, cylindrical hair-like cystidia up to 100 μ long, 5.5-8 μ in diam., protruding 25-65 u. (3) short, broad, thin-walled gloeocystidium-like elements, with apices rounded or narrowed at times /erlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum

to a point, $25-45 \times 8-11 \mu$, submerged or protruding up to 20 μ ; spores abundant, hyaline, light straw color in mass, smooth, ovoid, one-guttulate, $5-7 \times 7-11 \mu$. See figs. 1 and 2).

H a b i t a t: Generally on rotting wood, but at times growing from wounds of living trees. *Acer mono, Euphoria longana, Cinnamonum camphora*, and *Populus* sp. have been listed as living hosts.

Distribution: Specimens examined from Guam, Philippine Islands, Taiwan (Formosa), Japan, Ceylon, India, New Caledonia, Tonkin, Congo.

Illustrations: Patouillard, Bull. Soc. Myc. France **24**: 166, unnum. fig.; Stevenson and Aoshima, present paper, figs. 1 and 2.

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Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Sydowia

Jahr/Year: 1964

Band/Volume: 17

Autor(en)/Author(s): Stevenson John A., Aoshima K.

Artikel/Article: The Taxonomy of Polyporus mollissimus. 214-222