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## Reevaluation of *Hohenbuehelia nigra* and species with close affinities

E. Albertó<sup>1</sup>  
A. Fazio  
J. E. Wright

Universidad de Buenos Aires, Facultad de Ciencias  
Exactas y Naturales, Departamento de Ciencias  
Biológicas, Ciudad Universitaria, Pab. II, 1428  
Buenos Aires, Argentina

**Abstract:** Specimens tentatively determined as *Hohenbuehelia nigra* var. *microspora* were found in the environs of Buenos Aires. Study of collections in BAFC identified by Singer as *H. nigra* showed that var. *microspora* differed considerably from var. *nigra*. This led to a study of the holotypes of *H. nigra* var. *microspora* and *H. nigra* var. *nigra*. In the present paper specimens of *Hohenbuehelia nigra* var. *nigra* (Schwein.) Singer are redescribed and compared with *H. nigra* sensu Singer and Digilio, and with *H. subbarbata*. The taxonomic position of *H. nigra* var. *microspora* Singer is defined, for which the new name *H. singeri* is proposed, whereas for *H. nigra* sensu Singer and Digilio the variety *H. nigra* var. *pileocystidiata* is proposed.

**Key Words:** Agaricales, systematics

### INTRODUCTION

During a revision of the genus *Hohenbuehelia* in Argentina, a rather abundant species was found in the province of Buenos Aires, which we tentatively determined as *H. nigra* var. *microspora* Singer, belonging to subg. *Hohenbuehelia* Stirps *Atrocaeruleus* (with non-petaloid habit) (Singer, 1975). The study of a few collections in BAFC identified by Singer as *H. nigra* showed that var. *microspora* differed considerably from variety *nigra*, which prompted us to consider var. *microspora* as an autonomous species. This led us to study the holotype specimens of *H. nigra* var. *microspora* and *H. nigra* var. *nigra*.

*Hohenbuehelia nigra* was originally described as *Agaricus niger* by Schweinitz (1822). Fries (1828) validated it as *Agaricus (Pleurotus) niger*. Saccardo (1887) recorded it as *Pleurotus niger*. Coker (1944)

cited the species as *Pleurotus niger* Schwein. for North Carolina; his description was actually based on a study of the Schweinitz holotypes extant at BPI and PH. Libonati-Barnes (1981) indicated two interpretations of *H. nigra*: one by Coker (1944) and another by Singer and Digilio (1951) who also pointed out that the type of *Agaricus subbarbatus* Berk. & Curtis from Cuba was very similar to *Hohenbuehelia nigra* (Schwein.) Singer.

In the present paper we redescribe the type of *H. nigra*, and we compare it with *H. nigra* sensu Singer and Digilio and with *H. subbarbata*. In addition, we define the taxonomic position of *H. nigra* var. *microspora* Singer and *H. nigra* sensu Singer and Digilio, for which we propose a new name with rank of species for the former, and a new variety of *H. nigra* for the latter.

### MATERIALS AND METHODS

Collected specimens were described macroscopically in situ, then refrigerated for further microscopic examination in the laboratory. Color determination followed Munsell (1954). Abbreviations of author's names are according to Kirk and Ansell (1992). Free-hand sections of specimens were mounted in 10% KOH plus 1% aqueous solution of phloxine. All collections are deposited in the mycological Herbarium, Dept. de Ciencias Biológicas, Facultad de Ciencias Exactas y Naturales, University of Buenos Aires (BAFC). Herbaria abbreviations follow Holmgren et al. (1990).

### RESULTS

#### KEY TO TAXA TREATED

1. Pileocystidia absent; leptocystidial pleurocystidia present; spores 4–5(–5.5) × 3–5 μm . . . . . *H. singeri*
1. Pileocystidia present, leptocystidial pleurocystidia absent, pleurocystidia metuloid; spores > 6 μm long 2
2. Pileocystidia globose to pyriform, thin walled; pleurocystidia hyaline . . . . . *H. subbarbata*
2. Pileocystidia metuloid, if globose then thick-walled; pleurocystidia brown . . . . . 3
3. Two types of pileocystidia present; cutis formed by only one type of hyphae . . . *H. nigra* var. *pileocystidiata*

3. One type of pileocystidium present; cutis formed by three types of hyphae ..... *H. nigra* var. *nigra*

*Hohenbuehelia nigra* (Schwein.) Singer, Lilloa 22: 256. (1949) 1951. FIGS. 1-7

- = *Agaricus niger* Schwein., Syn. Fung. Car.: 90. 1822.
- = *Pleurotus niger* (Schwein.) Saccardo, Syll. Fung. 5: 380. 1887.
- = *Resupinatus niger* (Schwein.) Murr. N. A. F. I. 9: 242. 1915.

*Pileus* 3.5-7 mm diam, convex, circular, pseudo-stipe not observed, attached to substratum by the underside of the pileus, pruinose, very dark gray (5YR 3/1) at the base and black (5YR 2/1) towards the margin, lighter in the center due to a whitish pruina that becomes less abundant towards the margin until finally glabrous; margin crenulate, concolorous with pileus. *Lamellae* adnexed with eccentric attachment, close to distant, very dark gray (5YR 3/1); margin entire. *Context* appearing gelatinous in section when soaked, concolorous with pileus. *Spores* (FIG. 2) 7-7.5 × 4-4.5 μm, short ellipsoid, thin-walled, hyaline, fusoid, smooth, nonamyloid. *Basidia* (FIG. 2) 20-23 × 6.5-7.5 μm, clavate, 4-spored. *Basidioles* (FIG. 3) 25-30 × 4-5 μm, with gelatinizing walls up to 3 μm thick. *Pleurocystidia* pseudocystidiate (FIG. 5) metuloid, 50-70 × 8-14 μm, projecting ca 20 μm above the hymenium, with the basal portion immersed in the trama and usually recurved, very thick-walled, brown, darker at the base; pigment cytoplasmatic, becoming lighter to hyaline towards the apex; apex extremely acute, encrusted with small, nonamorphous polyhedral crystals. *Cheilocystidia* of identical shape and size. *Pileipellis* a cutis formed by three types of closely interwoven generative hyphae: (i) 2-5 μm diam, thick-walled, brown, clamped (FIG. 4), whose ends form structures similar to mycosclereids (Wright, 1955), very irregular in shape, 13-17 × 3.5-10 μm (FIG. 7); (ii) 1.5-2 μm diam, hyaline, clamped, thin-walled, and (iii) 1.5-2 μm diam, hyaline, clamped, thick-walled (FIG. 1). *Pileocystidia* (FIG. 6) metuloid, 22-32 × 8-10 μm, with a brown, thick wall and more or less blunt apex with encrusted crystals all along the cystidium. *Context* formed by a loose trama of clamped hyphae 1.5-2.5 μm diam with thin, gelatinized walls.

*Material studied.* *Agaricus niger* Schwein., U.S.A., North Carolina, Salem, HOLOTYPE PH, ISOTYPE BPI.

*Remarks.* This species is characterized by basidionata of small size, black pileus, dark lamellae, very large, dark brown metuloid cystidia and the presence of metuloid pileocystidia which Coker (1944) consid-

ered an infrequent character. The holotype material is scant but well preserved. It lacks a pruina, a feature which, according to Coker (1944), would be present in young specimens. The spore length he recorded is larger (7.4-9.5 μm) than our measurements (7-7.5 μm), otherwise we agree with Coker's concept of *Hohenbuehelia nigra*. Both collections studied (BPI and PH) are identical.

Miller (1986 and personal comm.) purports that the correct name for this species ought to be *H. niger* based on Art. 73 of the 1966 version of the International Code of Botanical Nomenclature (Lanjow, 1966) which governs the orthography of names and epithets, and the gender of generic names. We are unable to support this view since *Hohenbuehelia* is a feminine noun and thus the specific epithet must be declined in accordance, hence *Agaricus niger* becomes *H. nigra* as correctly stated by Singer (1951) and Dennis (1970), among others (cfr. Greuter (1994), Art. 60.1, 60.2 and also Recom. 60E,1 and Art. 23.5). This would also be the case of *H. crustosa* (bas. *Pleurotus crustosus*); *H. stratosata* (bas. *P. crustosus*); *H. geogenia* (bas. *P. geogenius*); *H. inversa* (*P. inversus*); *H. mastrucata* (*Agaricus mastrucatus*); *H. atrocoerulea* (*A. atrocoeruleus*); *H. silvana* (*A. silvanus*), which appeared in Miller (1986), and whose epithetic desinence has not been questioned.

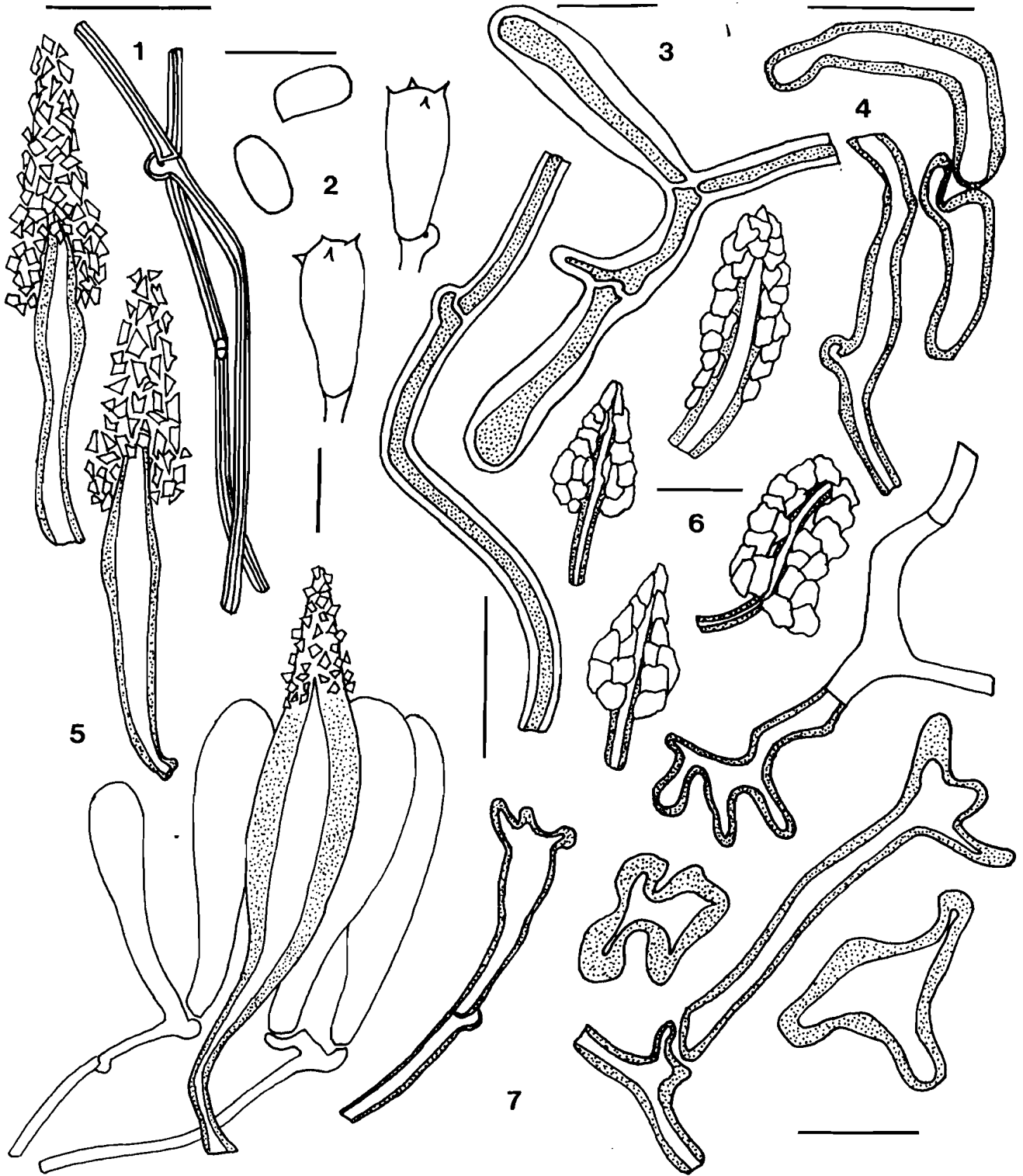
*Hohenbuehelia nigra* (Schwein.) Singer var. *pileocystidiata* Fazio & Albertó, var. nov. FIGS. 8-15

- = *Hohenbuehelia nigra* (Schwein.) Singer sensu Singer and Digilio, Lilloa 25: 117. 1951.

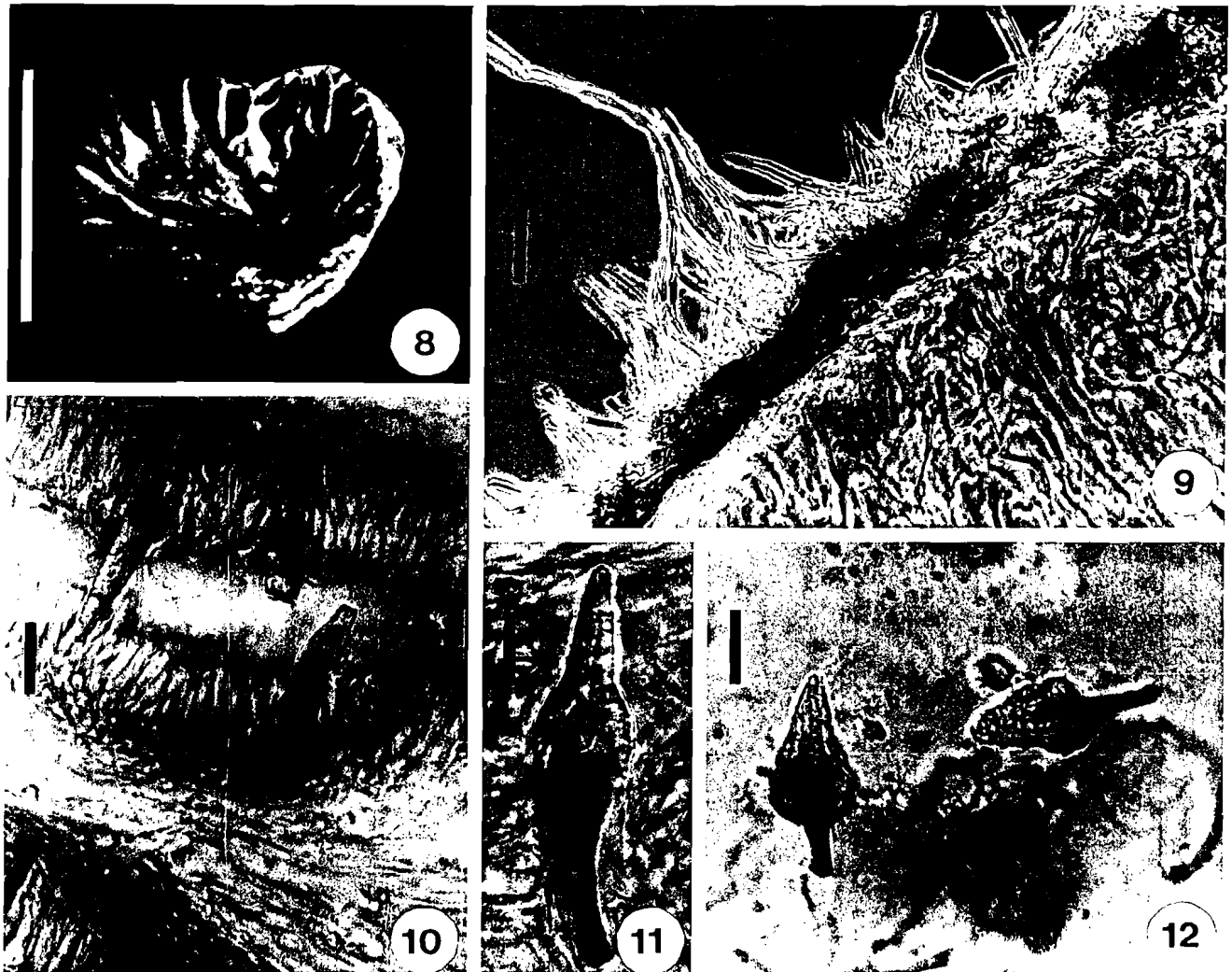
A typo differt pileocystidia duorum: a) normales ut in *H. nigra*; b) globosis, hyalinis, leviter crasse tunicatis. Cutis tantum hyphis hyalinis; basidiis longiorum usque ad 40 μm; basidiolis pariete gelineae absunt.

HOLOTYPE. ARGENTINA, Bonariae, Berazategui, Parque Pereyra, Singer & al., 20-VI-62, BAFC 33.232.

*Basidiocarp* 5-7 mm diam, pileate, conchate, with lamellate hymenophore, appressed to substrate by margin of pileus. *Lamellae* black (7.5 YR 2/0), distant to subdistant; lamellae margin light brown (7.5 YR 6/4). *Spores* (FIG. 15) 6.8-8.3 × 3.6-4.7 μm, ellipsoid to subcylindric, hyaline, smooth, nonamyloid. *Basidia* (FIG. 15) 25-40 × 5-6 μm, fusiform, 4-spored; sterigmata 5-6 μm long. *Basidiole* walls not gelatinized. *Pleurocystidia* pseudocystidiate, metuloid (FIGS. 10, 11), 43-65 × 10-15 μm, brown, with very acute thin-walled apices, with small encrusted crystals in the upper portion, measuring 5-8 μm diam without crystals. *Pileipellis* cutis of hyaline, thick-walled, clamped hyphae, 2-3 μm diam (FIG. 9). *Pileocystidia* of two types: some sphaero-pedunculate, 28-30 × 14-16



FIGS. 1-7. *Hohenbuehelia nigra* var. *nigra* (type specimen). 1. Pileipellis hyphae. 2. Basidia and basidiospores. 3. Hyphae and basidioles with gelatinized walls. 4. Pileipellis hyphae. 5. Metuloids. 6. Metuloid pileocystidia. 7. Mycosclereids. Scale bars = 10  $\mu$ m.



FIGS. 8–12. *Hohenbuehelia nigra* var. *pileocystidiata* (type specimen). 8. Basidioma. 9. Section of the pileus showing hyphae of the pileipellis and gelified hyphae of the trama. 10, 11. Metuloid pseudocystidia. 12. Metuloid pileocystidia. Scale bar: FIGS. 8 = 5 mm., 9, 11 = 10 µm., 12 = 15 µm, 10 = 20 µm.

µm, scattered, hyaline, with slightly thickened walls (FIG. 13), and others metuloid, 40–45 × 10–16 µm, with crystal encrustations (FIG. 12). We have observed in the cutis structures appearing as mycoscleroids (Wright, 1955), 10–15 × 8–10 µm, irregular in shape, yellowish brown, with very thick walls (FIG. 14).

*Material studied.* The holotype.

*Remarks.* Unfortunately we have been unable to study the original material on which Singer and Digilio (1951) based their description and which was deposited in LIL; this material must be presumed lost. Singer (1969, p. 61) recorded the only extant collection of *H. nigra* from Argentina (see citation of material above) under this epithet and we have based our description on this collection.

This variety is macroscopically identical with var. *nigra* but has some micromorphological differences.

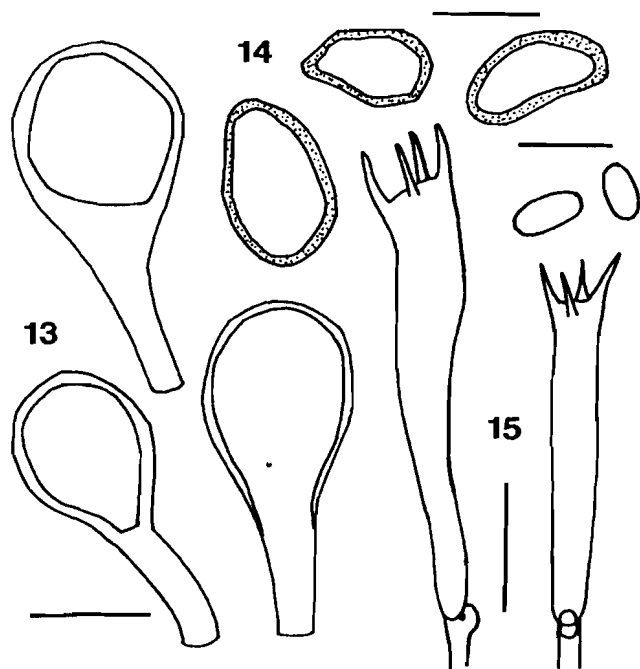
It is characterized by the presence of hyaline, thick-walled, clamped hyphae in the cutis; two types of pileocystidia, one metuloid and the other sphaeropedunculate, and slightly thick-walled (the latter are absent in *H. nigra* sensu Coker); and nongelatinized basidioles.

Singer and Digilio (1951) also indicated that *H. nigra* was very similar to *H. subbarbata*. An analysis of the holotype of *H. subbarbata* and a comparison with *H. nigra* is presented below.

*Hohenbuehelia subbarbata* (Berk. & Curtis) Sing., Lilloa 22: 255. (1949) 1951. FIGS. 16–21

≡ *Agaricus subbarbatus* Berk. & Curtis, J. Linn. Soc. Bot. 10: 288. 1869.

≡ *Pleurotus subbarbatus* (Berk. & Curt) Sacc., Syll. Fung. 5: 383. 1887.



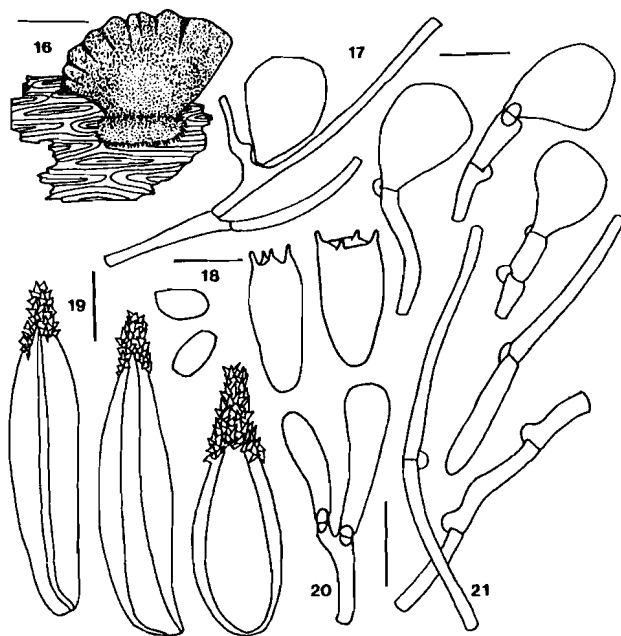
FIGS. 13–15. *Hohenbuehelia nigra* var. *pileocystidiata*. 13. Sphaeropedunculate pileocystidia type. 14. Mycosclereids. 15. Basidia and basidiospores. Scale bars = 10  $\mu$ m.

= *Resupinatus subbarbatus* (Berk. & Curtis) Murr., N. American flora 11: 242. 1915.

*Basidiocarp* 3–6 mm diam, semicircular to flabelloid, slightly pruinose on the surface; margin undulate, fuscous to fuscous-black; flesh dark gray, entirely gelatinous. *Lamellae* decurrent, crowded, narrow, concolorous. *Pseudostipe* tomentose with a white pruina or efflorescence at the base. *Spores* (FIG. 18) 6–6.7  $\times$  3.5–4  $\mu$ m, ellipsoid, smooth, hyaline, nonamyloid (only 5 spores seen). *Basidia* 22  $\times$  10  $\mu$ m, 4-spored. *Basidioles* 18–20  $\times$  4–5  $\mu$ m. *Cheilo-* and *pleurocystidia* (FIG. 19) metuloid, (30–)45–70  $\times$  12–15  $\mu$ m, abundant, ventricose to fusiform, scantily encrusted with crystals, hyaline to light yellowish; walls thin, medium to very thick with the latter more abundant, often becoming thinner-walled towards the base. *Pileipellis* a cutis of hyaline, clamped, thin-walled hyphae, 2  $\mu$ m diam (FIG. 21); pileocystidia subglobose to pyriform, 14–20  $\times$  10–12(–18)  $\mu$ m, thin-walled, abundant, with a clamp at the base (FIG. 17), mainly hyaline but also some with brown content.

*Material studied.* CUBA, Wright 808, K 39.995 (HOLOTYPE).

*Remarks.* *Hohenbuehelia subbarbata* is characterized by basidiomata with black pileus, slightly hispid surface and tomentose at the base, dark lamellae, and very characteristic metuloids, with a very thick, hyaline wall, thin lumen and a hyaline base. In addition,



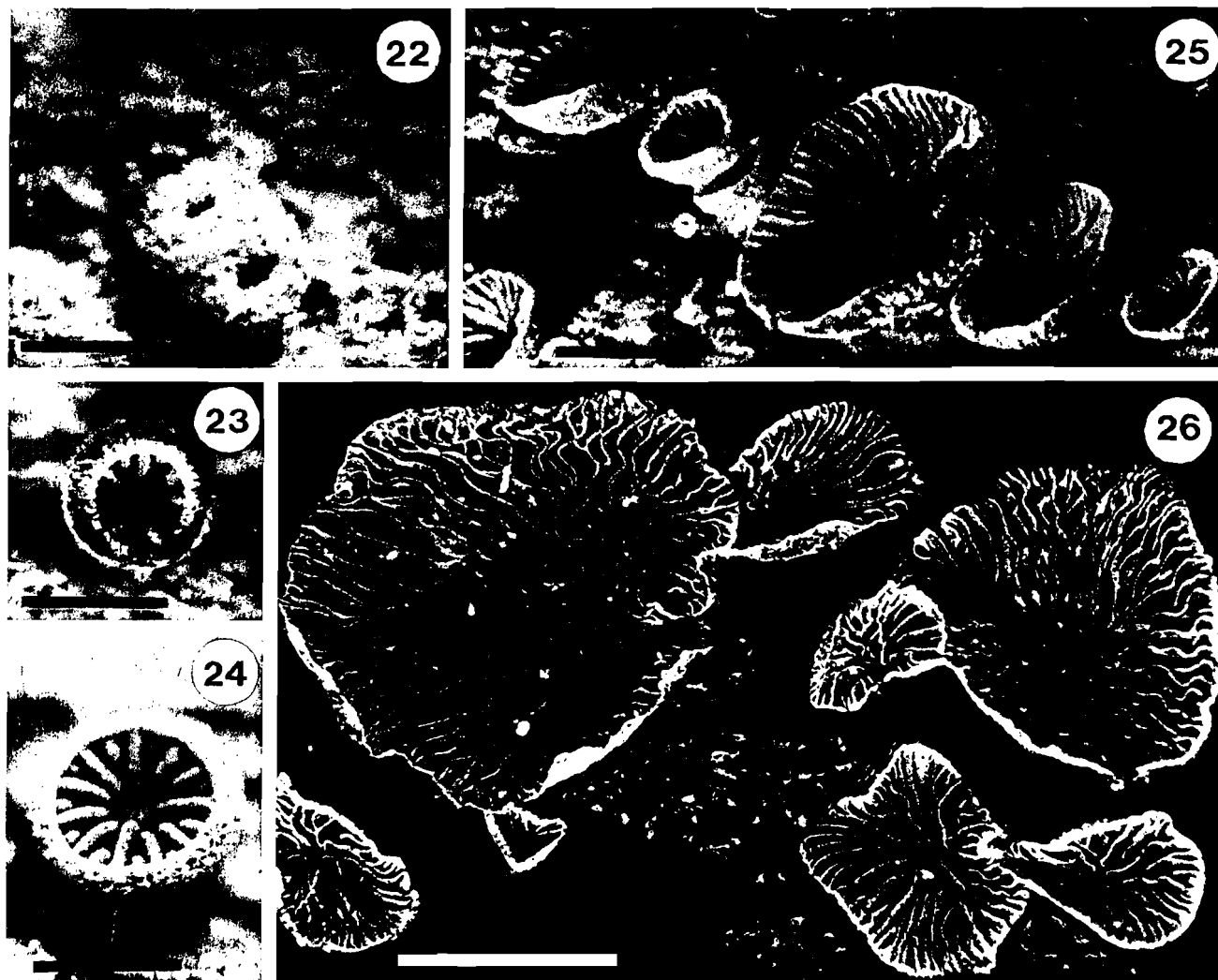
FIGS. 16–21. *Hohenbuehelia subbarbata* (type specimen). 16. Basidioma. 17. Globose, thin-walled pileocystidia. 18. Basidia and basidiospores. 19. Metuloid pleurocystidia. 20. Basidioles. 21. Pileipellis hyphae. Scale bars = 10  $\mu$ m except FIG. 16 = 2 mm.

the species has globose, thin-walled pileocystidia, and small elliptical spores. The holotype material is scant, and not well preserved, making confirmation of the tomentose surface of the pileus difficult to observe.

***Hohenbuehelia singeri* Albertó & Fazio, nomen nov**  
FIGS. 22–32

= *H. nigra* var. *microspora* Sing., Mycologia 47: 763 1955; non *H. microspora* (Speg.) Sing., Fieldiana Bot. 21: 42, 1989.

*Basidiocarp* (FIG. 22–26) up to 5 mm diam, circular to petaloid, subconchate to scutellate, subumbonate, pruinose, velvety, stipe absent, adhered to substrate by the central or sublateral dorsal portion, light gray (7.5 YR, 7/0) due to the presence of a white pruina which disappears towards the margin, in adult specimens very dark gray (5YR, 3/1) to blackish, hygrophanous, with a gelatinous aspect when soaked; margin acute, slightly pruinose and light grey when young, generally naked (pruina absent) in adult specimens, and then blackish. Flesh gelatinized, 0.5 mm thick in the widest portion becoming thinner towards the margin. *Lamellae* insinuated as a corrugation on the abhymenial surface, up to 0.7 mm wide, entire, interspersed with more or less distant lamellulae, black to very dark grey (5YR, 3/1) becoming lighter (7.5 YR, 5/4) towards the smooth margin. *Spores*



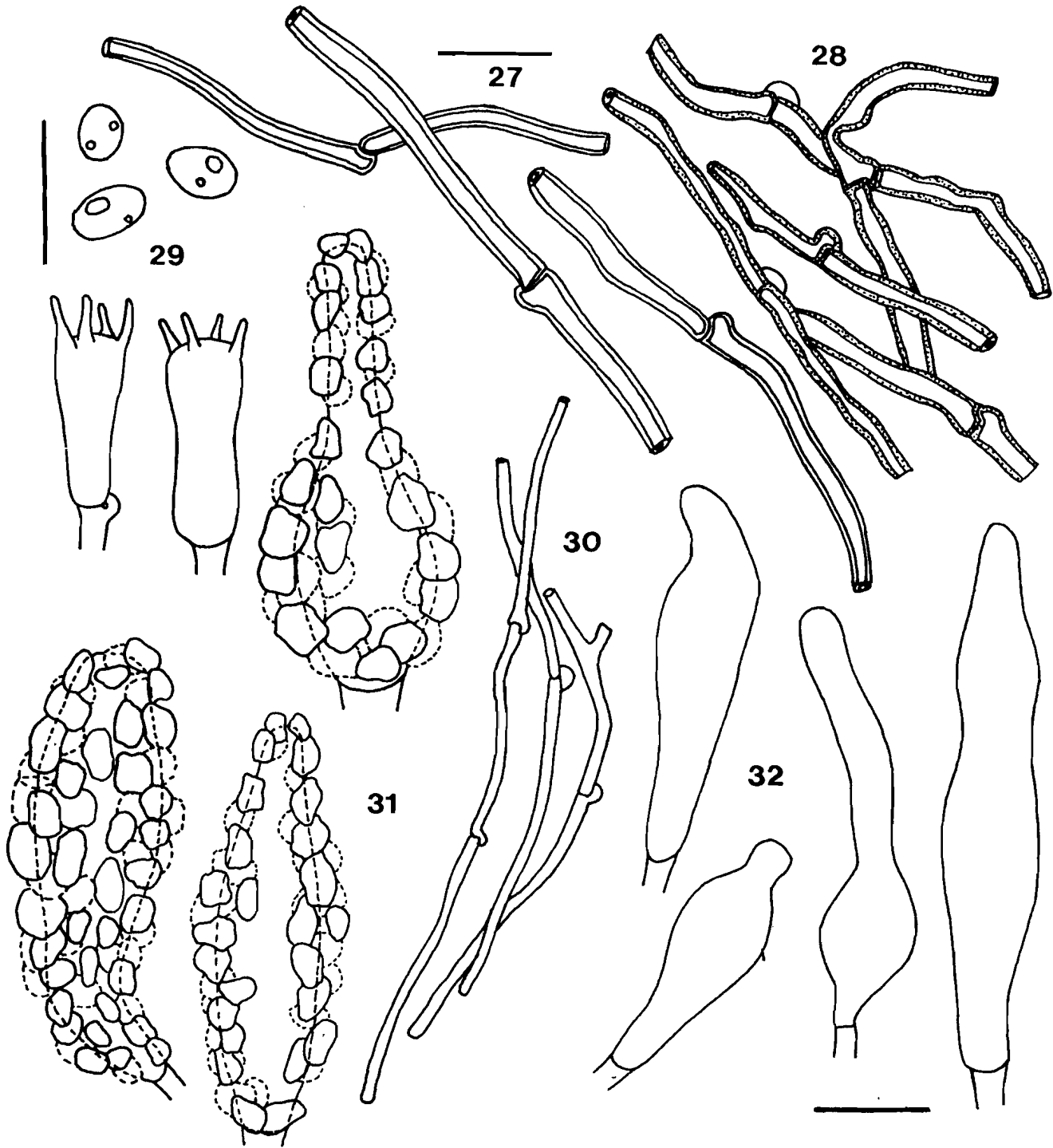
FIGS. 22-26. Different states of development of the basidiomata of *Hohenbuehelia singeri*. 22. Initial state (primordia); note that it is completely covered by a white pruina. 23. Intermediate state I: The pileus begins to expand. 24. Intermediate state II: Lamellae begin to differentiate. 25. Advanced state. 26. Basidiomata completely developed. Scale bars = 2 mm.

(FIG. 29)  $4-5(-5.5) \times 3-3.5 \mu\text{m}$ , ellipsoid, smooth, hyaline, nonamyloid, with guttulae. *Basidia* (FIG. 29)  $13-17 \times 4-6 \mu\text{m}$ , clavate, 4-spored. *Pleurocystidial leptocystidia* appearing metuloid in Melzer's reagent  $30-60 \times 10-25 \mu\text{m}$  (FIG. 31) encrusted with amorphous crystalline substance, crystals soluble in KOH; cystidial walls thin to slightly thickened,  $20-40 \times 4-12 \mu\text{m}$  without crystals (FIG. 32). *Subhymenium* very dense, formed by short and nodulose hyphae. *Pileipellis* formed by three types of hyphae: (i) thin-walled, hyaline, clamped, somewhat branched,  $1.5-2.5 \mu\text{m}$  diam. (FIG. 30); (ii) thick-walled hyaline, clamped, slightly or not branched  $3-4 \mu\text{m}$  diam. (FIG. 27), and (iii) thick-walled, with brown intraparietal pigment, clamped, tortuous and branched,  $3-4 \mu\text{m}$  diam (FIG. 28). *Pileocystidia* absent. Context hyphae immersed in a gelatinous matrix, abundantly clamped, thin-walled, up to  $3 \mu\text{m}$  diam. *Lamellae tra-*

*ma* irregular, of clamped, hyaline hyphae up to  $4 \mu\text{m}$  diam, immersed in a gelatinous matrix.

*Material studied.* ARGENTINA, Buenos Aires, Delta, INTA, E. Albertó, 11-II-94, BAFC 33.301; Burzaco, E. Albertó, 7-VI-93, BAFC 33.305; Buenos Aires, Llavallol, Sta. Catalina, E. Albertó, 27-I-94, BAFC 33.299; 4-IV-94, BAFC 34.356; 4-VI-94, BAFC 34.359; Buenos Aires, Llavallol, Sta. Catalina, A. Fazio, 3-V-94, BAFC 34.357, BAFC 34.358, BAFC 34.360 and BAFC 34.361; Buenos Aires, Llavallol, Sta. Catalina, E. Fernández, 16-VI-94, BAFC 34.355; Buenos Aires, Llavallol, Sta. Catalina, A. Sosmovsky, 22-VI-96, BAFC 34.362. PANAMA, Corundú, Martin and Welden (no. 8.353), 13-VIII-52 (Holotype of *H. nigra* var. *microspora*; F).

*Remarks.* This species is characterized by a dark pileus with cinereous hues due to the presence of a whitish pruina abundant in young specimens (FIGS. 22-24), total absence of pileocystidia, small spores, and the presence of two types of pleurocystidia, (i)



FIGS. 27-32. *Hohenbuehelia singeri*. 27, 28. Pileipellis hyphae. 29. Basidia and basidiospores. 30. Pileipellis hyphae. 31. Leptocystidial pleurocystidia covered with amorphous crystals. 32. Leptocystidial pleurocystidia without crystals. Scale bar: FIGS. 27, 28, 30 = 15  $\mu$ m., 29, 31, 32 = 10  $\mu$ m.

abundant leptocystidia with thin walls and (ii) scant cystidia, with only slightly thickened walls; both types covered by a sheath of amorphous, opaque crystals (FIG. 31) that dissolve in KOH (FIG. 32). The opaque crystals do not allow the observation of cystidial walls.

When a fresh slide of the lamellae is observed under the microscope, the crystals become loose and fall off; as a consequence these can be seen as skull-caps slowly moving along the slide; after a few minutes they are completely dissolved.



Development of basidiomata follows a simple gynomycarpic pattern: (i) an incipient rounded, woolly, sessile fruitbody (primordia) with a central opening (FIG. 22) in which the lamellae appear later (FIG. 23); (ii) an intermediate state I, as an outgrowth of the pileus margin, centripetally extend (FIG. 24); (iii) an intermediate state II until the lamellae reach the middle point, corresponding roughly to the umbo by which the fruitbody adheres to substrate (FIG. 25); (iv) fully developed fruitbodies with sinuous lamellae probably due to contraction of tissues (FIG. 26).

#### DISCUSSION

*H. nigra* (Schwein.) Singer *sensu vero* vs. *H. nigra* (Schwein.) Singer *sensu Singer and Digilio*.—Singer and Digilio (1951), for the most part agreed with Coker (1944), although with some minor differences in basidiocarp and spore size, probably the result of varying degrees of basidiocarp maturation. They suggested that the Argentine material could be a form of Schweinitz's *Hohenbuehelia nigra*. Furthermore, they only observed one type of metuloid pileocystidia in the Argentine material. Singer and Digilio (1951) reported that their specimens measured 4–12 mm diam, with spores  $6.8\text{--}7 \times 3.5\text{--}3.8 \mu\text{m}$ , in contrast to the measurements of *H. nigra* given by Coker (1944), viz. basidiomes 3.5–7 mm diam and spores  $7\text{--}7.5 \times 4\text{--}4.5 \mu\text{m}$ .

Even though we have studied only one specimen of each species, after a comparative study we observed significant differences between the specimens. The type material of *Hohenbuehelia nigra* has the cutis formed by three types of hyphae, whose thick-walled brown ends form well-defined mycosclereids; has only metuloid-type pileocystidia; basidia up to 23  $\mu\text{m}$  long; and gelatinized basidioles. In comparison, *H. nigra sensu Singer and Digilio* has the cutis formed by only one type of hyaline, thick-walled hyphae, whose ends form scant, differently shaped mycosclereids (cf. FIGS. 7, 14), two types of pileocystidia (one metuloid and another sphaero-pedunculate, hyaline, with slightly thickened walls), basidia up to 40  $\mu\text{m}$  long, and has nongelatinized basidioles. We consider these differences taxonomically significant and accept *H. nigra sensu Singer and Digilio* as a distinct variety of *H. nigra*, which we name *pileocystidiata*.

*H. nigra* (Schwein.) Singer *sensu Singer and Digilio* vs. *H. subbarbata* (Berk. & Curtis) Sing.—Singer and Digilio (1951) pointed out that the type of *Agaricus subbarbatus* Berk. & Curtis from Cuba was very similar to *Hohenbuehelia nigra* (Schwein.) Singer, but *A. subbarbatus* appeared to have a slightly hispid pileus sur-

face, the spores measured  $6.7 \times 4\text{--}4.2 \mu\text{m}$ , and the metuloids reached  $75 \times 14 \mu\text{m}$ . Moreover, unless the constant presence of pileocystidia and larger spores in all specimens could be proved, they would feel inclined to recognize all of them as forms of the same species.

Dennis (1953) redescribed the holotype of *P. subbarbatus* (Berk. & Curtis) Sacc. but later (Dennis, 1970) considered this name synonymous under *H. nigra* (Schwein.) Sing. Comparing the type materials we concluded that although macroscopically these specimens are very similar, the metuloids and spores are different enough to separate them. *Hohenbuehelia nigra* has metuloid pseudocystidia ( $50\text{--}70 \times 8\text{--}14 \mu\text{m}$ ) with very thick, brown walls, and short ellipsoid spores ( $7\text{--}7.5 \times 4\text{--}4.5 \mu\text{m}$ ) (FIG. 5), whereas *H. subbarbata* has metuloids ( $(30\text{--})40\text{--}70 \times 12\text{--}15 \mu\text{m}$ ) also with very thick walls but which are hyaline to light yellowish (FIG. 19), and smaller spores ( $6\text{--}6.7 \times 3.5\text{--}4 \mu\text{m}$ ). The pileocystidia are also different; the type specimen of *H. subbarbata* has only one type of pileocystidia that are subglobose or pyriform and thin-walled (FIG. 17). The type specimen of *H. nigra* var. *nigra* has also only one type but it is metuloid whereas the specimen of *H. nigra sensu Singer and Digilio* has two types of pileocystidia: a metuloid type (FIG. 12) and a subglobose or pyriform type but with thick walls (FIG. 13). It may be argued that the scant number of spores found in the holotype of *H. subbarbata* could be attributed to the immaturity of the basidiocarps. However, we consider that the differences between pileo- and pleurocystidia of both *H. subbarbata* and *H. nigra* var. *nigra*, pointed out above, are not due to the possible immaturity of *H. subbarbata*; thus we believe they are independent taxa.

*H. nigra* (Schwein.) Singer *sensu vero* vs. *H. nigra* var. *microspora* Sing.—Macroscopically basidiomata of both taxa are similar, although *H. nigra* var. *microspora* has smaller basidiomata with a more abundant white pruina in young specimens (FIGS. 22–24). Microscopically, however, the differences are conclusive. The examined specimen of variety *nigra* has spores measuring  $7\text{--}7.5 \times 4\text{--}4.5 \mu\text{m}$ , brown-walled metuloid pseudocystidia, measuring  $50\text{--}70 \times 8\text{--}14 \mu\text{m}$  with regular and rhombic crystals and a recurved base (FIG. 5), whereas var. *microspora* has smaller spores ( $4\text{--}5\text{--}5.5 \times 3\text{--}3.5 \mu\text{m}$ ) and hyaline metuloid cystidia measuring  $30\text{--}60 \times 10\text{--}25 \mu\text{m}$  covered with amorphous crystals that dissolve in KOH (FIGS. 31, 32). Furthermore, *H. nigra* var. *microspora* lacks pileocystidia.

Based on the above features, we believe that var. *microspora* deserves specific rank. However, the specific epithet *microspora* is preoccupied by *H. micro-*

*spora* (Speg.) Sing. based on *Pleurotus portegnius* Speg. var. *microspora* Speg. that Singer (1989) raised to specific rank. We therefore name this species *H. singeri* in honor of the late mycologist Dr. R. Singer.

## ACKNOWLEDGMENTS

We wish to thank Dr. E. Horak (ETHS, Zürich), who confirmed our identification of *H. nigra* var. *microspora*. We also want to thank the curators of F, BPL, K, LIL, and PH for the loan of specimens in their keeping. Drs. R. Petersen (TENN) and Dennis Desjardin (SFSU) kindly read the type-script and made valuable suggestions. Photographs were processed at the Instituto Fitotécnico de Santa Catalina (University of La Plata). This research was financed by the Argentine Nat'l Research Council (CONICET); paper no. 104 of the PRHIDEB.

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