

Actinomyces coelicolor speciesgroup. J.

ology and taxonomy of the actinomycetes.

the vegetative and sporogenous phases
ly acid fast pro actinomycetes. J. gen.

s-SAZDOVAL, MARIA. Características de los
s. (1955) Rev. Inst. Salub. Enferm. Trop.,

life cycle of sporing actinomycetes as
nd septation. J. gen. Microbiol., 1, 22—37.
udies in the genus *Nocardia*. I. Develop-
77.

udies in the genus *Nocardia*. II. Cytological

udies in the genus *Nocardia*. III. The
. Y. Acad. Sci., 60, 168—181.

Pleomorphic organism showing relation-
omycetes. J. Infect. Dis., 52, 253—267.

SPECIES OF HYPOCRELLA¹

E. B. MAINS

(10.VII.1959)

The genus *Hypocrella* contains species parasitic on scale insects, Coccidae and white flies, Aleyrodidae. Many of the species were first described in the conidial condition as species of *Aschersonia* and it is probable that most or all of the species of *Aschersonia* are conidial stages of species of *Hypocrella*. PETCH (1921) has published a comprehensive treatment of the two genera. In a study of the species of tropical America additional information has been obtained concerning some of the species which is presented here.

Types and other specimens were made available for this study from the Farlow Herbarium (FH) by J. MACKENZIE LAMB; from the Herbarium of the New York Botanical Garden (NY) by CLARK T. ROGERSON; from the Mycological Collections, U. S. Bureau Plant Industry (BPI) by JOHN A. STEVENSON; from the Herbarium of the Florida Agr. Exp. Sta. (FLAS) by ERDMAN WEST; from the Herbarium of the University of California (UC) by HERBERT L. MASON; from the Naturhistoriska Riksmuseet of Sweden (S) by T. E. HASSELROT; from the Instituto de Botanica Spegazzini (LPS) by JUAN C. LINDQUIST; and from the Herbarium of the Instituto Agronomico do Estado de São Paulo (IAC) by A. P. VIÉGAS.

Hypocrella caulium (BERK. & CURTIS) PAT. Bull. Soc. Mycol. Fr. 30 : 346. 1914. *Corticium caulium* BERK. & CURTIS. J. Acad. Nat. Sci. Philad. 2 : 279. 1854. *Hypocrella camerunensis* var. *brasili-ana* P. HENN. Hedwigia 43 : 85. 1904.

This species is fairly common in the American tropics. It usually is collected in a sterile condition and PATOULLARD (1914) and PETCH (1921) concluded that it was first described by BERKELEY & CURTIS from sterile stromata from Surinam, as *Corticium caulium*. A portion of the type collection in the Curtis Collection of the Farlow Herbarium does not contain a fungus. R. W. G. DENNIS informs me that the part of the type in the Kew Herbarium is sterile and appears to be the fungus treated by PETCH as *Hypocrella caulium*. PATOULLARD transferred *C. caulium* to *Hypocrella* on the supposition that it was conspecific with *H. camerunensis* P. HENN. from Africa. HENNINGS also described a variety, *H. camerunensis* var.

¹) Paper from the Herbarium and the Department of Botany, University of Michigan, Ann Arbor, Michigan.

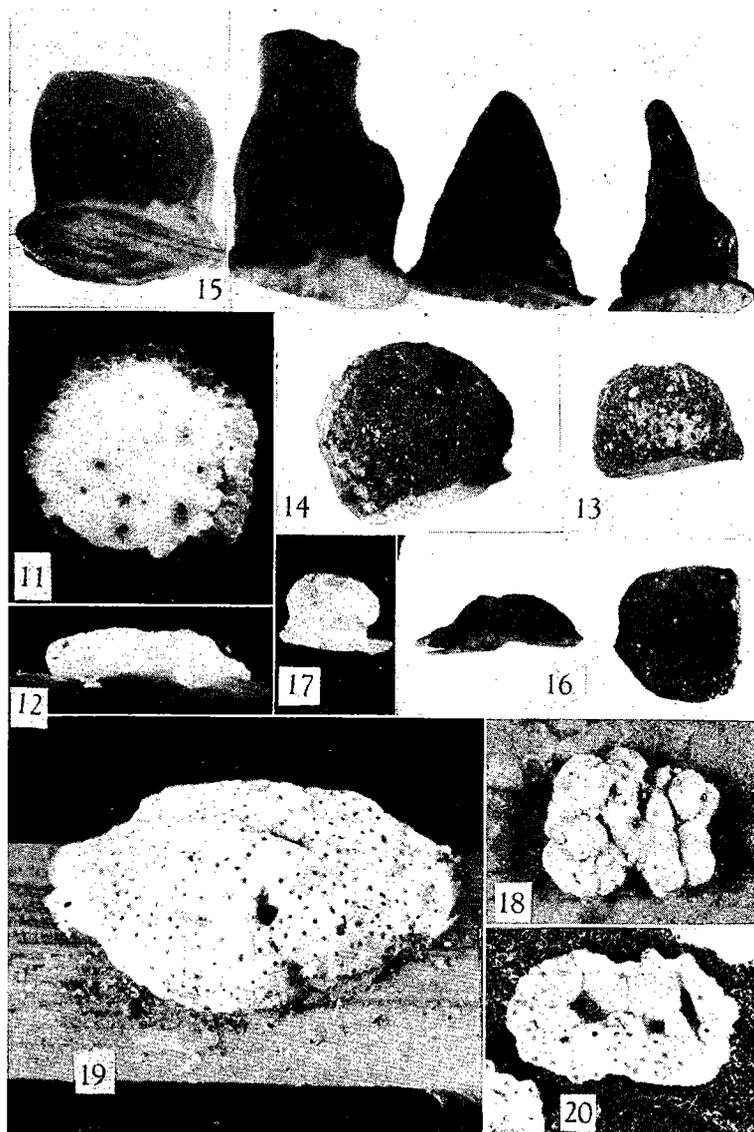


Fig. 11 and 12, *H. aurantiaca*, type, stromata, 11, top view, 12, side view, 10 ×.

Fig. 13, *H. guaranitica*, type, stroma, side view, 10 ×.

Fig. 14, *H. orbicularis*, Noack FH, stroma, side view, 10 ×.

Fig. 15, *H. cornuta*, type, four stroma showing variations, side views, 5 ×.

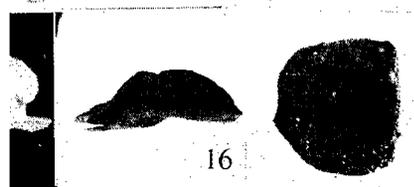
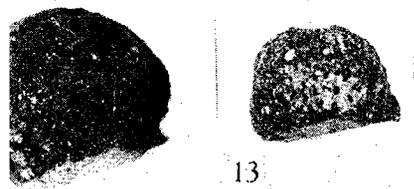
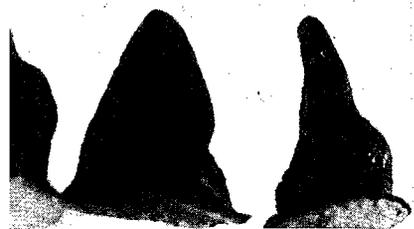
Fig. 16, *H. melaena*, type, stromata, side and top views, 5 ×.

Fig. 17, *H. disjuncta*, type, stroma, side view, 10 ×.

Fig. 18, *H. colliculosa*, type, stroma, top view, 10 ×.

Fig. 19, *H. andropogonis*, FH6257, stroma, side view, 10 ×.

Fig. 20, *H. amazonica*, type, stroma, top view, 10 ×.



stromata, 11, top view, 12, side view, 10 ×.
 , type, stroma, side view, 10 ×
 back FH, stroma, side view, 10 ×.
 showing variations, side views, 5 ×.
 stromata, side and top views, 5 ×.
 type, stroma, side view, 10 ×.
 type, stroma, top view, 10 ×.
 FH6257, stroma, side view, 10 ×.
 type, stroma, top view, 10 ×.

the American tropics in the *Aschersonia* stage only, two other collections made by C. L. LINDER, Nos. 7949 and 861a, in British Guiana (NY) with the perithecial stage have been seen.

The species is distinguished by having the pycnidia produced in one or more flat or concave disks on a more or less bulbous base (fig. 3 also THAXTER figs. 1—7). The pycnidia are irregular, labyrinthiform and the pycnidiospores fusoid, $10-12 \times 3-4 \mu$. Paraphyses are not produced. The perithecia develop in one or more swellings or cushions usually associated with pycnidial disks. They are flask-shaped, $400-600 \times 150-250 \mu$ with well defined walls up to 30μ thick. The asci are cylindrical or somewhat fusoid, $200-250 \times 8-12 \mu$ with $3-4 \mu$ thick caps. The part-spores are cylindrical, $8-14 \times 2-3 \mu$, with rounded ends.

Hypocrella schizostachyi P. HENN. Philad. J. Sci. 3 : 45. 1908.

HENNINGS described this species from stromata collected by FOXWORTHY on *Schizostachyum* from Rizal, Luzon, Philippines, Phil. Bur. Sci. No. 46. Parts of the type collection are in the Herbarium of the New York Botanical Garden and in Mycological Collections, U. S. Bureau Plant Industry. The stromata (fig. 4) are irregularly globoid, 6—10 mm wide, irregularly tuberculate to cerebriform, grayish brown, purple in KOH. The perithecia are scattered, completely embedded and flask-shaped, $400-500 \times 175-230 \mu$ with walls up to 35μ thick. The asci are cylindrical, $170-205 \times 6 \mu$ with 3μ thick caps. The ascospores break into cylindrical part-spores, $4-8 \times 1.5-2 \mu$. HENNINGS describes the stromata as 1.5—2 cm wide.

This species is very similar to *H. gartneriana* MÖLLER from Brazil which differs mostly in the light yellow stromata which do not change to purple when treated with KOH.

Hypocrella libera SYD. Ann. mycol. 14 : 85. 1916.

This species was described by SYDOW as on coccids from a collection by E. ULE, No. 3413, from Cobija, Rio Acre, Bolivia. The type has not been seen and probably does not exist. It is not among the specimens of the Sydow Herbarium at Stockholm. PETCH (1925) gives a description which apparently was made of the type. He also concludes that the pycnidial stage is *Aschersonia aleyrodidis*. This conclusion was mostly based on two collections on scale insects by J. R. JOHNSTON from Changuinola, Panama received from Professor THAXTER. One (No. 3951) occurs under *Aschersonia* and the other (No. 4099) as *Hypocrella aleyrodidis*. in the Farlow Herbarium. The stromata (fig. 5) are thin, flat to slightly scutate, 2—5 mm wide and tuberculate. The perithecia occur singly in the tubercles mostly on the margins of the stromata and are immature. The pycnidia are poorly developed in the center of the stromata and the pycnidiospores are fusoid, $10-14 \times 1.5 \mu$. Paraphyses were not seen. The hosts are probably Aleyrodidae.

Hypocrella libera is very similar to *H. raciborskii* of the eastern hemisphere as treated by PETCH (1921). It has similar tuberculate stromata. The pycnidial stage, *Aschersonia placenta* is also very similar to *A. aleyrodidis*. It is doubtful if the two should be recognized as distinct species. However it is questionable whether *H. raciborskii* described by ZIMMERMANN is the same as the species reported by PETCH. ZIMMERMANN (1901) does not illustrate a tuberculate condition and he states that the perithecia are entirely embedded.

Hypocrella sloaneae PAT. in DUSS, Enumeration Champignons Guadeloupe et Martinique p. 80. 1903.

The type of *Hypocrella sloaneae* was collected by DUSS on *Sloanea* in Guadeloupe in 1903. It is in the PATROUILLARD Collection of the Farlow Herbarium. The stromata (fig. 6) are pulvinate, 1—3 mm wide, light yellowish brown, tuberculate with a slight hypothallus. The tubercles are crowded over the entire stroma. The perithecia occur singly in the tubercles and are ovoid, 350—450 \times 200 μ . The asci are somewhat fusoid, 300—350 \times 14—16 μ with 6 μ thick caps. The part-spores are fusoid, 8—12 \times 2 μ , acute at the ends. Pycnidia do not occur.

PETCH (1921) has described a pycnidial stage for *H. sloaneae*. His description and illustrations were taken from the type of *H. amazonica* which he treats as a synonym. *H. amazonica* is somewhat verrucose, not tuberculate, and the asci cylindrical and smaller (see following). *H. nectrioides* and *H. sloaneae* are very similar. According to PETCH the stromata of *H. nectrioides* are rosy orange when fresh. There is no information concerning the color of stromata of *H. sloaneae* in the fresh condition. In the dried condition those of *H. nectrioides* are white and those of *H. sloaneae* are light yellowish brown. According to the description given by PETCH (1921) *H. amomi* of the eastern hemisphere is also very similar to *H. sloaneae*.

Hypocrella nectrioides THAXTER ex PETCH, Ann. Roy. Bot. Gard. Peradeniya 7 : 225. 1921.

PETCH described this species from collections by R. THAXTER on scale insect on *Pentaclethra* sp. St. Ann's Valley, Port of Spain, Trinidad. There are two collections in the Farlow Herbarium, Nos. 3996 and 4296, collected by THAXTER on *Cocci* on *Pentaclethra*, Maraval Valley, Port of Spain, Trinidad, and determined by PETCH as *Hypocrella nectrioides*. They have pulvinate, white, tuberculate stromata (fig. 7), 1—2 mm wide. The tubercles are crowded over the entire stroma. The perithecia occur singly in the tubercles and are ovoid to flask-shaped, 450—500 \times 300—350 μ with walls up to 35—40 μ thick. The asci are somewhat fusoid, 300—350 \times 12—16 μ with 4—6 μ caps. The part-spores are somewhat fusoid or asymmetric, 9—16 \times 2—3 μ , with rounded ends. Pycnidia do not occur.

PETCH (1925) later concluded that *H. nectrioides* was the same

as *F.*
the t
to be

H.

Th
by F

Port

the

that

Farl

in T

and

cond

speci

Th

wide,

100—

dric,

The

4—7

indic

were

stron

diosp

the p

Soi

sterile

Hy

7 : 23

Th

in he

perith

THAX

4264,

crella

collec

minec

line of

from

hypot

\times 15

to 20

somev

ascosp

multis

Pycni

ilar to *H. raciborskii* of the eastern
 H (1921). It has similar tuberculate
Aschersonia placenta is also very
 otful if the two should be recognized
 t is questionable whether *H. raci-*
 N is the same as the species report-
 01) does not illustrate a tuberculate
 e perithecia are entirely embedded.

DUSS, Enumeration Champignons
 1903.

ae was collected by DUSS on Sloanea
 n the PATROUILLARD Collection of
 omata (fig. 6) are pulvinate, 1—3
 n, tuberculate with a slight hypo-
 owded over the entire stroma. The
 tubercules and are ovoid, 350—450
 t fusoid, 300—350 × 14—16 μ with
 es are fusoid, 8—12 × 2 μ, acute
 cur.

a pycnidial stage for *H. sloaneae*.
 ons were taken from the type of
 s as a synonym. *H. amazonica* is
 rculate, and the asci cylindrical and
ctrioides and *H. sloaneae* are very
 the stromata of *H. nectrioides* are
 e is no information concerning the
 in the fresh condition. In the dried
 s are white and those of *H. sloaneae*
 ording to the description given by
 aster hemisphere is also very similar

ER ex PETCH, Ann. Roy. Bot. Gard.

s from collections by R. THAXTER
 sp. St. Ann's Valley, Port of Spain,
 ions in the Farlow Herbarium, Nos.
 THAXTER on Cocci on *Pentaclethra*,
 Trinidad, and determined by PETCH
 have pulvinate, white, tuberculate
 le. The tubercules are crowded over
 ecia occur singly in the tubercules
 50—500 × 300—350 μ with walls up
 omewhat fusoid, 300—350 × 12—16
 pores are somewhat fusoid or asyme-
 unded ends. Pycnidia do not occur.
 ed that *H. nectrioides* was the same

as *H. libera*. The stromata of the later are flat and thinner with
 the tubercles mostly developed on the margin. *H. nectrioides* appears
 to be closer to *H. sloaneae*.

Hypocrella castanea PETCH, Trans. Brit. Mycol. Soc. 16 : 224. 1932.

This species was described by PETCH from specimens collected
 by R. THAXTER on an aleyrodid on *Adiantum* sp. from St. Ann's,
 Port of Spain, Trinidad. PETCH previously (1921) had determined
 the collections as *H. palmicola* and his figs. 31 and 32, Pl. 3 of
 that species are of *H. castanea*. There are three specimens in the
 Farlow Herbarium Nos. 4089, 4245, and 4247 collected by THAXTER
 in Trinidad and determined by PETCH as *H. palmicola*. Two, 4245
 and 4247 are given as from St. Ann's Valley, No. 4247 is in the best
 condition and should probably be considered the lectotype of the
 species.

The stromata (fig. 8) are discoid or flattened pulvinate, 1 mm
 wide, dark brown. The perithecia are flask-shaped, 200—250 ×
 100—130 μ, with walls 20 μ thick. The asci are slender, cylin-
 dric, 70—100 × 3—4 μ and the walls are not thickened into a cap.
 The ascospores are broken into cylindrical one-celled fragments,
 4—7 × 1.5 μ, in the asci. The narrow asci and few part-spores
 indicate that the asci probably are two or four-spored. Pycnidia
 were not seen. PETCH describes them as central and single in the
 stromata as shown by his fig. 32, pl. 3 (PETCH (1921)). The pycni-
 diospores are given as fusoid, 4—6 × 1 μ, ends not produced and
 the paraphyses as up to 130 μ long.

Some of the stromata of No. 4245 in the Farlow Herbarium have
 sterile horn-like projections.

Hypocrella viridans PETCH, Ann. Roy. Bot. Gard. Peradeniya
 7 : 236. 1921.

This species is usually collected in the pycnidial stage and occurs
 in herbaria as *Aschersonia viridans* (BERK. & CURTIS) PAT. The
 perithecial stage was described by PETCH from collections by
 THAXTER obtained in Trinidad. Collections Nos. 4261, 4262, 4263,
 4264, 4267, 4025 and 4086 in the Farlow Herbarium under *Hypo-*
crella viridans and *Aschersonia viridans* having perithecia were
 collected by THAXTER in Trinidad, 4261, 4263 and 4068 being deter-
 mined by PETCH. The stromata (fig. 9) are discoid, circular in out-
 line or sometimes slightly crenulate, 1—2.5 mm wide, green, punctate
 from the scattered ostioles of the perithecia with a slight to broad
 hypothallus. The perithecia are scattered, flask-shaped, 300—350
 × 150—200 μ. The necks are surrounded by an obconic tissue up
 to 200 μ wide of longitudinal, thin-walled hyphae. The asci are
 somewhat fusoid, 120—175 × 6—7 μ with 2 μ thick caps. The
 ascospores are filiform attenuated below, 50—100 × 2—2.5 μ,
 multiseptate, the cells 16—20 μ long. Part spores were not seen.
 Pycnidia usually accompany the perithecia often in a peripheral

circle. They are globoid to flattened globoid, 200—400 μ wide, usually with moderately wide orifices. The pycnidiospores are fusoid, 10—16 \times 2 μ with acute ends. The paraphyses are 60—150 μ long.

H. citrina is a very similar species differing mostly in having yellow stromata. *H. discoidea* of the eastern hemisphere with red stromata is also closely related.

Hypocrella citrina SPEG. Bol. Acad. Cienc. Cordoba 11 : 537. 1889.

This species was described from a collection by J. PUIGGARI, No. 2538, from Apiaty, S. Paulo, Brazil, 1888. The type in the Herbarium Spegazzini No. 904 has been studied. The stromata (fig. 10) are discoid or flattened pulvinate, 0.5—2.0 mm wide, light yellow, punctate from the brownish ostioles and with broad fibrose hypothalli. Mature perithecia are few, globoid with short ostioles, 250—300 μ wide. The asci are somewhat fusoid or clavate, 120—150 \times 6—8 μ , with multiseptate, filiform ascospores, 100—110 \times 1.5 μ not breaking into segments. Most of the stromata bear only pycnidia but a few also have perithecia. The pycnidia are oblate spheroid constricted above into narrow ostioles, 400—500 \times 400—450 μ . The pycnidiospores are fusoid, 12—16 \times 2 μ and the paraphyses filiform up to 200 μ long.

THEISSEN (1911) concluded that this species was the same as *H. ochracea* MASSEE which PETCH (1921) considers to be *H. phyllogena*. However, it is distinct from the latter in both the perithecial and pycnidial stages. The Aschersonia stage is *A. flavocitrina*.

Hypocrella aurantiaca (PETCH) comb. nov. *Stereocrea aurantiaca* PETCH, Trans. Brit. mycol. Soc. 23 : 136. 1939.

This species was described by PETCH as *Stereocrea aurantiaca* from a collection on the aleyrodid *Paraleyrodia perseae* from Gainesville, Florida sent to him by ERDMAN WEST. The type collected by WEST and VOORHEES No. 11876 has been studied from specimens in the Herbarium of the Florida Agr. Exp. Sta. (21166) and in Mycological Collections U. S. Bureau Plant Industry. The stromata (figs. 11 & 12) are discoid, 1—2 mm wide, orange-yellow, smooth or verrucose, with narrow somewhat fimbriate hypothalli. The asci are fusoid, 150—200 \times 12—16 μ with 4—6 μ caps. The ascospores are narrowly fusoid or clavate, 110—150 \times 4—5 μ , multiseptate not breaking into fragments. Pycnidia occur with the perithecia. The pycnidiospores are fusoid 20—34 \times 4—5 μ , with acute ends. The walls are slightly thickened at the ends, 1—2 μ . The paraphyses are filiform, up to 150 μ long.

PETCH noted the similarity to species of *Hypocrella* but decided that the fusoid asci and the fusoid, non-fragmenting ascospores excluded it. These characters are found in various degrees in species of *Hypocrella* and it is therefore included in that genus.

ttened globoid, 200—400 μ wide, orifices. The pycnidiospores are ends. The paraphyses are 60—150 μ

species differing mostly in having f the eastern hemisphere with red

Acad. Cienc. Cordoba 11 : 537. 1889.

from a collection by J. PUIGGARI, Ilo, Brazil, 1888. The type in the as been studied. The stromata (fig. ilvinate, 0.5—2.0 mm wide, light ish ostioles and with broad fibrose e few, globoid with short ostioles, somewhat fusoid or clavate, 120—150 iform ascospores, 100—110 \times 1.5 μ t of the stromata bear only pycnidia

The pycnidia are oblate spheroid stioles, 400—500 \times 400—450 μ . The 6 \times 2 μ and the paraphyses filiform

that this species was the same as CH (1921) considers to be *H. phyl-* om the latter in both the perithecial rsonia stage is *A. flavocitrina*.

H) comb. nov. *Stereocrea aurant-* Soc. 23 : 136. 1939.

by PETCH as *Stereocrea aurantiaca* d *Paraleyrodia perseae* from Gaines- RDMAN WEST. The type collected 76 has been studied from specimens Agr. Exp. Sta. (21166) and in Myco- Plant Industry. The stromata (figs. wide, orange-yellow, smooth or ver- fimbriate hypothalli. The asci are ith 4—6 μ caps. The ascospores are 1—150 \times 4—5 μ , multiseptate not dia occur with the perithecia. The 4 \times 4—5 μ , with acute ends. The the ends, 1—2 μ . The paraphyses

species of *Hypocrella* but decided soid, non-fragmentating ascospores e found in various degrees in species included in that genus.

Hypocrella palmae (BERK. & CURTIS) SACC. Syll. fung. 2 : 580. 1883. *Hypocrea palmae* BERK & CURTIS, J. Acad Nat. Sci. Philad. 2 : 285. 1854.

BERKELEY & CURTIS described this species from specimens on leaves of palm from Surinam from the Schweinitz Herbarium. There is a specimen in the Curtis Collection of the Farlow Herbarium which is part of the type. It consists of one stroma which is hemispherical, 2 mm wide and brownish black. The perithecia are immature. BERKELEY & CURTIS state that the perithecia are "scarcely mature". PETCH (1921) states that the type specimen in the Kew Herbarium has two stromata which are two-thirds globose 2 and 4 mm wide, black and with perithecia peripheral and part-spores 8—9 \times 2 μ . This species as treated by PETCH is very variable especially in the shape of the stromata and he lists ten synonyms. Of these *H. spagazzini* SACC., *N. guaranitica*, SPEG., *H. globosa* SYD., *H. orbicularis* SYD., and *H. sydowii* SACC. & TROTTER are discussed here. PETCH (1921) describes the stromata of *H. palmae* as hemispherical or two-thirds globose, up to 6 mm diameter, red-brown becoming black and the perithecia as peripheral, flask-shaped 300—400 \times 200 μ with asci 160 \times 8 μ and part-spores cylindrical, 5—10 \times 1.5—2 μ , with rounded ends. His description of pycnidia is based on a collection by THAXTER from Trinidad which does not appear to be *H. palmae*.

Hypocrella reineckiana P. HENN. one of the most common species of the eastern hemisphere is probably conspecific with *H. palmae*. A comparison of the descriptions given by PETCH shows a very close similarity.

Hypocrella guaranitica SPEG. Fungi Guaranitici Pugillus 1. No. 256. 1883.

This species was described from a collection by B. BALANSA, No. 3546 from Villa-Rica, Paraguay. The type is in the Herbarium of the Instituto Spegazzini, No. 901. Part of the type collection is also in the Herbarium of the New York Botanical Garden. The stromata (fig. 13) are subspherical or hemispherical, 1—2 mm wide, dark chocolate brown or black. The perithecia are flash-shaped, 400—450 \times 200—250 μ with walls 30 μ thick and the asci cylindrical, 175—225 \times 6—8 μ , with walls not or only slightly thickened at the apices. The part-spores are cylindrical, 4—8 \times 1.5 μ , rounded at the ends. Pycnidia were not found. As PETCH (1921) has concluded this is conspecific with *H. palmae*.

Hypocrella spagazzini SACC. Syll. fung. 2 : 579. 1888.

SACCARDO based this species on a collection by J. PUGGARI No. 1483 from Apiahy, S. Paulo, Brazil, published by SPEGAZZINI (1881) as *H. phyllogena* (Fungi Argentini 209). The type, No. 903 in the herbarium of the Instituto Spegazzini, has flattened pul-

vinate, brownish black stromata, 1—5 mm wide. The perithecia are flask-shaped $400\text{--}500 \times 150\text{--}300 \mu$, with walls up to 35μ thick. The asci are agglutinated and uncertain. Notes and sketches on the packet by SPEGAZZINI give the asci as cylindrical to clavate, $160\text{--}200 \times 10\text{--}15 \mu$ and the part-spores as cylindrical $3\text{--}8 \times .75\text{--}1 \mu$ with rounded ends. PETCH (1921) has concluded that this is *H. palmae*. The stromata are flatter than usual for *H. palmae* and the asci as given by SPEGAZZINI are wider.

Hypocrella orbicularis SYD. in THEISSEN, Ann. mycol. 9:67. 1911.

This species was described from a collection by F. NOACK, No. 675, from São Francisco dos Campos, São Paulo, Brazil and originally named *H. globosa* by the SYDOWS (1907). RACIBORSKI had previously in 1906 named a species from Java, *Hypocrella globosa*. *H. globosa* SYD. was also independently renamed *H. sydowii* by SACCARDO & TROTTER (1913). There is a collection of *H. globosa* SYD. in the Farlow Herbarium from the herbarium of THEISSEN collected by NOACK at São Paulo, Brazil which probably is part of the type. It consists of three black globoid stromata 3 mm wide (fig. 14). The perithecia are flask-shaped, $350\text{--}400 \times 200 \mu$ with walls 30μ thick. The asci are agglutinated and uncertain. *H. orbicularis* appears to be *H. palmae* as concluded by PETCH (1921). *H. globosa* RAC. is probably *H. reineckiana* according to PETCH (1921) and it is doubtful if the latter is distinct from *H. palmae*.

Hypocrella cornuta H. P. KRUG in VIEGAS Bragantia 4:93. 1944. nom. nudum.

VIEGAS listed this species for Brasil and stated that it had not been described and he informs me that it has not since been described. The reare several specimens Nos. 2900, 3692 and 5129 so named in the herbarium of the Instituto Agronomico do Estado, São Paulo, Campinas, Brasil. Most of the stromata (fig. 15) are more or less conoid, some laterally flattened and a few hemispherical, 2—6 mm wide and 3—7 thick. They are dark brown to black. The perithecia are flask-shaped, $300\text{--}400 \times 150\text{--}200 \mu$ with walls $20\text{--}30 \mu$ thick. The asci are cylindrical, $150\text{--}200 \times 7\text{--}8 \mu$ with the walls slightly thickened at the apices. The ascospores break into somewhat fusoid part-spores, $8\text{--}10 \times 1.5 \mu$, rounded at the ends. Pycnidia were not found.

This appears to be a variant of *H. palmae*. It differs principally in the conoid shape. However, some hemispherical stromata occur (fig. 15).

Hypocrella melaena SYD. Philad. J. Sci. 8 Sec. C:494. 1913.

This species was described from a collection by RAMOS, Phil. Bur. Sci. No. 20614, from San Antonio, Prov. Laguna, Philippines, February 1913. Portions of the type collection in the Herbarium of the New York Botanical Garden and in Mycological Collections, Bureau

Plan
Herl
scuta
450-
amp
walls
spore
were
with
asci.
asci j
speci
basec
speci

Hy
1881.

Hy
from
Guiar
applic
as or
base
fig. 4
with
there
The s
allant
of col
shape
It is r
amph
and so
neck.

The
than s
princi
mata
lustra
Moelle
pl. 2

Picr
shaped
and th
mata t
margin
2 μ wi
shaped

a, 1—5 mm wide. The perithecia are 3—12 mm wide and black. The perithecia are flask-shaped, 450—500 × 250—300 μ. The mature asci are fusoid or narrowly amphoric, 155—175 × 10—14 μ, narrowing to 5—6 μ above, the walls not or slightly thickened 1—1.5 μ at the apices. The part-spores are cylindrical, 4—6 × 1.5 μ rounded at the ends. Pycnidia were not found. PETCH (1921) considers this species as conspecific with *H. reineckiana* which has subspherical stromata and cylindrical asci. The flat scutate stromata and fusoid to narrowly amphoric asci justify the recognition of *H. melaena* as a separate species. The specimen of THAXTER from Trinidad upon which PETCH (1921) based his description of pycnidia of *H. palmae* appears to be this species.

THEISSEN, Ann. mycol. 9:67. 1911. From a collection by F. NOACK, No. 1881, São Paulo, Brazil and originally described by SYDOWS (1907). RACIBORSKI had described a species from Java, *Hypocrella globosa*, which he independently renamed *H. sydowii* by here is a collection of *H. globosa* SYDOWS. The herbarium of THEISSEN collected a specimen which probably is part of the type. The stromata are subglobose, 3 mm wide (fig. 14), 350—400 × 200 μ with walls 30 μ thick and uncertain. *H. orbicularis* is included by PETCH (1921). *H. globosa* is a synonym according to PETCH (1921) and it is distinct from *H. palmae*.

FIGUEIRA in VIEGAS Bragantia 4:93. 1944.

FIGUEIRA in VIEGAS Bragantia 4:93. 1944. From Brazil and stated that it had not been described since it has not since been determined. Nos. 2900, 3692 and 5129 were collected at the Instituto Agronomico do Estado, Rio de Janeiro. Most of the stromata (fig. 15) are subglobose, flattened and a few hemispherical. They are dark brown to black, 300—400 × 150—200 μ with walls cylindrical, 150—200 × 7—8 μ with the walls thickened at the apices. The ascospores break into 10 × 1.5 μ, rounded at the ends.

FIGUEIRA in VIEGAS Bragantia 4:93. 1944. of *H. palmae*. It differs principally in having some hemispherical stromata occur

FIGUEIRA in VIEGAS Bragantia 4:93. 1944. ad. J. Sci. 8 Sec. C:494. 1913.

FIGUEIRA in VIEGAS Bragantia 4:93. 1944. From a collection by RAMOS, Phil. Bur. No. 1881, Laguna, Philippines, February 1913. The collection is in the Herbarium of the University of Michigan, Bureau of

Plant Industry, Washington, D. C. (General Collection and Lloyd Herbarium 5919) have been studied. The stromata (fig. 16) are flat, scutate, 3—12 mm wide and black. The perithecia are flask-shaped, 450—500 × 250—300 μ. The mature asci are fusoid or narrowly amphoric, 155—175 × 10—14 μ, narrowing to 5—6 μ above, the walls not or slightly thickened 1—1.5 μ at the apices. The part-spores are cylindrical, 4—6 × 1.5 μ rounded at the ends. Pycnidia were not found. PETCH (1921) considers this species as conspecific with *H. reineckiana* which has subspherical stromata and cylindrical asci. The flat scutate stromata and fusoid to narrowly amphoric asci justify the recognition of *H. melaena* as a separate species. The specimen of THAXTER from Trinidad upon which PETCH (1921) based his description of pycnidia of *H. palmae* appears to be this species.

Hypocrella phyllogena (MONT.) SPEG. Fungi Argentini No. 209. 1881. *Hypocrea phyllogena* MONT. Ann. Sci. nat. ser. II, 13:340. 1840.

Hypocrea phyllogena was described and illustrated by MONTAGNE from a collection No. 580 by LEPRIEUR from Cayenne, French Guiana. SPEGAZZINI, in transferring the species to *Hypocrella* misapplied the name to *H. palmae*. MONTAGNE described the stromata as orange, smooth, hemispherical or pulvinate, constricted at the base (MONTAGNE figs. 4 o & p). The ascus is illustrated (MONTAGNE fig. 4s) as somewhat fusoid and the part-spores (fig. 4t) as allantoid with a slight swelling in the middle. According to PETCH (1921) there is only one stroma in the type in the Montagne Herbarium. The shape of the stromata given as studshaped by PETCH and the allantoid part-spores with middle swellings are unusual. In a study of collections having these characters it has been found that the shape of the ascus differs somewhat from that given by MONTAGNE. It is more fusoid to narrowly amphoric being shaped like a narrow amphora gradually narrowing below from a width of 10—16 μ and somewhat abruptly narrowing above to a more or less cylindrical neck.

The stromata of the species as treated by PETCH are more variable than shown by MONTAGNE. Although he distinguished the species principally by having studshape stromata he states that the stromata are also pulvinate, conical or conico-convex. MONTAGNE illustrated the stromata as smooth. PETCH has concluded that *Moelleria sulphurea* BRES. with verrucose stromata (PETCH 1921 pl. 2 fig. 17) is conspecific.

Pycnidia have been found associated with perithecia. In the stud-shaped stromata the perithecia open on the surface of the head and the pycnidia are mostly found in the stipe. In the pulvinate stromata the perithecia are mostly in the center and the pycnidia in the margin. The pycnidiospores are distinctive. They are fusoid, 8—14 × 2 μ with the walls at the ends attenuately thickened, 2—4 μ. Stud-shaped stromata frequently occur having only pycnidia. In this

condition the species was described as *Aschersonia basicystis* BERK. & CURTIS.

Hypocrella verruculosa MÖLLER. Phycomyceten und Ascomyceten p. 299. 1901.

This species was apparently described from one stroma from Blumenau, Brazil. According to PETCH (1921) it was preserved in alcohol at Berlin. It probably is not now in existence. As described and illustrated by MÖLLER the stroma was subglobose, 7 mm wide, yellowish brown and very verrucose. The ascus is illustrated as clavate without a cap and described as 600 μ long and 4-spored. The part spores are illustrated as narrowly ellipsoid and described as 12—15 \times 3—5 μ . Pycnidia are not described.

THEISSEN (1911) has reported a collection made by RICK in Brazil as this species. This has been distributed as No. 294 of RICK's Fungi Austro-americi. It is a mixture of two species. The flattened pulvinate, grayish-brown smooth stromata appear to be an undescribed species. The stromata of the other species are hemispherical to studform, 2—3 mm wide, 1.5—2 mm thick, light brownish yellow, more or less verrucose. The perithecia are flask-shaped, 450—500 \times 250—300 μ , with walls up to 50 μ thick. The asci are fusoid to narrowly amphoric, 200—250 \times 12—16 μ , with walls not thickened into a cap. The part-spores are cylindrical somewhat fusoid or allantoid, 10—14 \times 2—4 μ , with rounded ends. It differs from *H. verruculosa* as described by MÖLLER in the shape of the stromata, size and shape of the part-spores. As PETCH (1921) has concluded it is the verrucose form of *H. phyllogena*. *H. verruculosa* has also been reported from Brazil by VIEGAS (1944) for a collection by H. P. KRUG (JAC 2894). It is only in pycnidial condition and the identity is doubtful.

Hypocrella disjuncta SEAVER, Mycologia 12 : 97. 1920.

This species was based on a collection by JOHNSTON and STEVENSON No. 1640 from Naguabo, Puerto Rico. A brief description is given by SEAVER who mentions only asci and ascospores. The following description is from the type in the Herbarium of the New York Botanical Garden and a part of the type in Mycological Collections U. S. Bureau of Plant Industry.

The stromata (fig. 17) are hemispherical, studform or pulvinate, smooth or slightly verrucose, 1—2 mm wide, yellowish, punctate on the head or in the center from the ostioles of the perithecia, with orifices of the pycnidia round or irregular on the shanks or margins of the stromata. The perithecia are flask-shaped, 350—400 \times 200—250 μ , with walls up to 50 μ thick and the asci fusoid or narrowly amphoric, 150—230 \times 10—12 μ , with 2 μ thick caps. The ascospores break into 1-celled allantoid to somewhat fusoid part-spores, 5—10 \times 1.5—2 μ , frequently with a median swelling on the concave side and with ends rounded. The pycnidia are irreg-

ular
Par
app
par
P
that
very
scrib
10—

H
T
2339
Spe
pulv
and
They
500
200
6—1
host

H
TH
CAM
is in
Paul
They
Ther
They
spore
were
cuben

In
state
them
form,
thick
oblon
is qu
that
perith

Hy
7 : 24

PE
P. HI
lectio

ed as *Aschersonia basicystis* BERK.

Phycomyceten und Ascomyceten

described from one stroma from PETCH (1921) it was preserved in not now in existence. As described stroma was subglobose, 7 mm wide, mucose. The ascus is illustrated as depicted as 600 μ long and 4-spored. spores narrowly ellipsoid and described as not described.

From a collection made by RICK in 1921 distributed as No. 294 of RICK's collection of two species. The flattened stromata appear to be an undeveloped form of the other species are hemispherical, 2 mm thick, light brownish yellow, perithecia are flask-shaped, 450—500 μ thick. The asci are fusoid to 12—16 μ , with walls not thickened cylindrical somewhat fusoid or allantoid ends. It differs from *H. verruculosa* in the shape of the stromata, size and color. PETCH (1921) has concluded it is the same as *H. verruculosa* has also been recorded for a collection by H. P. KRUG (1944) for a collection by H. P. KRUG in a similar condition and the identity is

Mycologia 12 : 97. 1920.

Collection by JOHNSTON and STEVENSON and Ricardo Rico. A brief description is given of only asci and ascospores. The type is in the Herbarium of the New York Botanical Garden part of the type in Mycological Institute Industry.

Stromata hemispherical, studform or pulvinate, 2—2 mm wide, yellowish, punctate on the ostioles of the perithecia, smooth and irregular on the shanks or perithecia are flask-shaped, 350—400 μ thick and the asci fusoid or cylindrical, 10—12 μ , with 2 μ thick caps. Spores allantoid to somewhat fusoid frequently with a median swelling and ends rounded. The pycnidia are irreg-

ular, up to 400 μ wide and the pycnidiospores fusoid, 5—8 \times 1.5 μ . Paraphyses are lacking. The host is given as white fly. It however appears to be a scale insect which is substantiated by the lack of paraphyses.

PETCH (1925) concluded from the description given by SEAVER that *H. disjuncta* was conspecific with *H. phyllogena*. They are very similar but differ in the pycnidiospores which were not described by SEAVER. The pycnidiospores of *H. phyllogena* are larger, 10—14 \times 2 μ with the walls at the ends attenuately thickened 2—5 μ .

Hypocrella colliculosa SPEG. Fungi Puiggariani No. 301. 1889.

This species was described from a collection by J. PUIGGARI No. 2339 from Apiahy, S. Paulo, Brazil. The type from the Herbarium Spegazzini No. 902 has been studied. The stromata (fig. 18) are pulvinate, 0.5—2.5 mm wide, irregularly verrucose to colliculose and glabrous. SPEGAZZINI describes them as "pallide subaurantia". They are now light brown. The perithecia are flask-shaped, 400—500 \times 200—300 μ with walls 25—30 μ thick and the asci cylindrical, 200 \times 8—10 μ , with 2 μ thick caps. The part-spores are cylindrical, 6—10 \times 2—2.5 μ , with rounded ends. Pycnidia were not found. The host is uncertain.

Hypocrella fluminensis KRUG, Jornal Agronomia 3 : 75. 1940.

This species was described from a collection by FELISBERTO DE CAMARGO from Theresopolis, Prov. Rio de Janeiro, Brazil. The type is in the Herbarium of the Instituto Agronomico do Estado de São Paulo, Campinas, Brazil, No. 2871. Only a few stromata occur. They are pulvinate, 1.5—2 mm wide and are brown to dark gray. There is a large central orifice. The pycnidia are irregularly lobed. They are given as 654—1140 \times 715—836 μ by KRUG. The pycnidiospores are fusoid, 9—12 \times 2.5—4 μ , with acute ends. No paraphyses were found as was also noted by KRUG. It appears to be *Aschersonia cubensis*.

In the one stroma examined perithecia were not found. KRUG states that they occur in the basal part of the stroma. He describes them as flask-shaped, 350—470 \times 167—243 μ and the asci as fusiform, 182—243 \times 10—16 μ with the wall not or only slightly thickened at the apices. The part-spores are described as ovate-oblong, 7—11.5 \times 2—3 μ . The hosts are given as Aleyrodidae. This is questionable. The lack of paraphyses in the pycnidia indicate that the hosts probably are Coccidae. Both in the pycnidial and perithecial stages the fungus agrees very well with *H. epiphylla*.

Hypocrella andropogonis PETCH, Ann. Roy. Bot. Gard. Peradeniya 7 : 247. 1921.

PETCH described the perithecial stage of *Aschersonia andropogonis* P. HENN. from a collection made by THAXTER in Trinidad. A collection No. 6257 in the Farlow Herbarium determined by PETCH

