

ASPERGILLUS LEPORIS, A NEW SPECIES RELATED TO *A. FLAVUS*¹

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(WITH 6 FIGURES)

The *Aspergillus* species described below has been isolated from white-tailed jack rabbit dung and from surface soil collected in a northern Wyoming sagebrush community.

***Aspergillus leporis* States & Christensen, sp. nov.**

FIGS. 1-6

Coloniae in agar Czapekii 4-6 cm diam decem vel duodecim diebus 24-26 C crescentes, floccosae, in primo albae deinde olivaceae (2, Tab. XXX); facies reversa incolorata vel pallide albo-flava. Sclerotia nigra, crescentes recte indefinite, abundantia, plerumque $2-3 \times 1$ mm sed vicina sclerotia saepe concresecunt ita ut corpora informia 6×4 mm vel majora fiant. Capitula conidica in primo globosa deinde plerumque dense columnaria et toto decidua, cylindrata vel conica, usque $1,000 \times 70-270 \mu$; conidiophorae $140-2,500 \times 6.5-13.0 \mu$, membranis vel 2μ crassis, aequabiliter albo-flavae, echinulatae; vesiculae membranis crassis, globosae vel subglobosae, plerumque $20-50 \mu$ sed usque 75μ diam; sterigmata plerumque duoseriata, primaria $6.5-13.3 \times 3.8-8.2 \mu$, secundaria $5.5-11.5 \times 2.1-3.4 \mu$, raro uniseriata in minoribus vesiculis et $5.2-7.3 \times 2.0-2.5 \mu$; conidia globosa vel subglobosa, flava, enodia vel eleganter rugosa, plerumque $3.0-3.3 \mu$ diam sed usque 4.0μ cum tenacibus disjunctioribus.

HOLOTYPE: Cultura exsiccata (RMF 99) in anno 1964 e *Lepus torrensensis* stercore in Wyoming, U. S. A., collecto isolata et in herbario NY imposita.

Colonies on Czapek's solution agar growing rapidly at room temperature (24-26 C), attaining a diameter of 4-6 cm in 10-12 days, plane or slightly wrinkled, floccose, white becoming ecru-olive to buffy olive (2, Pl. XXX) with development of conidial structures, these sparse, most abundant centrally; sclerotia developing on the surface of the felt at 6-8 days, at first appearing as white masses near 1 mm in diam, later becoming black with white apices, conspicuous and abundant (FIG. 1); reverse uncolored to pale yellow; odor not pronounced; exudate colorless, characteristic on developing sclerotia. *Conidial heads* at first globose then commonly becoming tight single columns deciduous as a unit, cylindrical $70-150 \mu$ wide or conical with apex flared to near 270μ ,

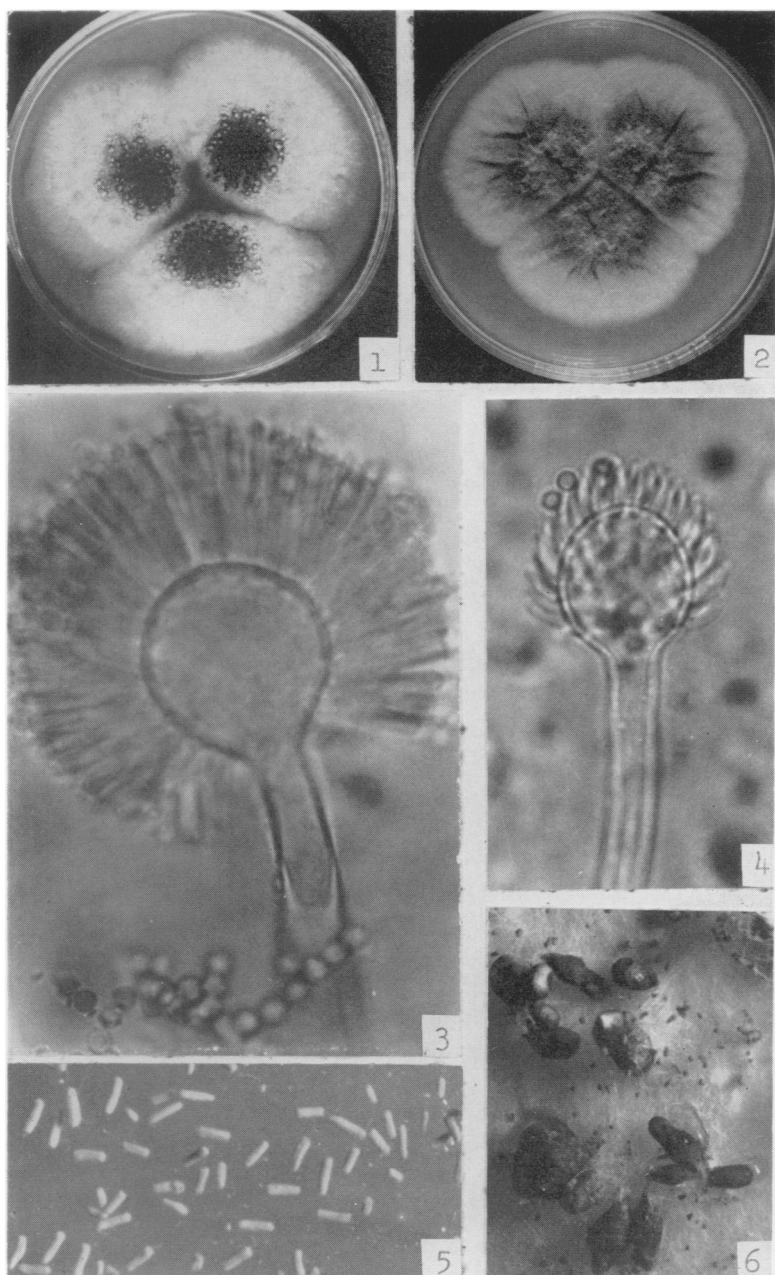
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occasionally split into divergent segments, up to 1 mm long in old cultures (FIG. 5); *conidiophores* extremely variable in length, up to 2.5 mm by $6.5\text{--}13.0\ \mu$ when arising from submerged hyphae, commonly $140\text{--}820\ \mu$ long when borne from aerial hyphae, stalks mostly non-septate, walls uniformly yellow-pigmented $1\text{--}2\ \mu$ thick, slightly to coarsely roughened; *vesicles* thick-walled, fertile over three-fourths or more of the surface, globose to subglobose, mostly $20\text{--}50\ \mu$ but ranging up to $75\ \mu$ in diam; *sterigmata* predominately biseriate, primaries mostly $6.5\text{--}12.5 \times 3.8\text{--}6.0\ \mu$ but occasionally slightly longer and swollen to near $8.2\ \mu$ in diam, secondaries $5.5\text{--}11.5 \times 2.1\text{--}3.4\ \mu$, rarely uniseriate $5.2\text{--}7.3 \times 2.0\text{--}2.5\ \mu$ on small vesicles (FIGS. 3, 4); *conidia* globose to subglobose, yellow by transmitted light, smooth or very slightly roughened, mostly $3.0\text{--}3.3\ \mu$, rarely $3.5\text{--}4.0\ \mu$ in diam, joined by tenacious connectives up to $0.5\ \mu$ long. *Sclerotia* scattered or in concentric zones, black, commonly vertically elongate with apical portion white and indeterminate in growth, mostly $2\text{--}3\ \text{mm}$ in long axis by $1\ \text{mm}$ wide but adjacent sclerotia often coalescing to form irregular aggregations $4\ \text{mm}$ wide by $6\ \text{mm}$ high or larger (FIG. 6).

Colonies on malt agar spreading more rapidly, $7.5\text{--}8.5\ \text{cm}$ in 10 days, lightly floccose up to $3\ \text{mm}$ deep, plane and near Krönberg green (2, Pl. XXXI); conidiophores more abundant than on Czapek's medium and up to $4.5\ \text{mm}$ long; sclerotia commonly not fused, less abundant and somewhat smaller than on Czapek's medium.

The type culture, RMF 99, was isolated from fresh dung of white-tailed jack rabbit (*Lepus townsendii*) collected near Saratoga, Wyoming. The HOLOTYPE, a dried plate culture, has been placed in the Cryptogamic Herbarium of The New York Botanical Garden. Iso-types, also in the form of dried plate cultures, have been placed in the Cryptogamic Herbarium of the University of Wyoming and in the Herbarium at the Commonwealth Mycological Institute, Kew, Surrey, England. Living cultures of *Aspergillus leporis* RMF 99 have been deposited in the American Type Culture Collection, Rockville, Maryland (ATCC 16490), and with the Centraalbureau voor Schimmelcultures, Baarn, Netherlands.

The species description has been based upon the type culture and three additional cultures which were obtained in a recent survey of the soil microfungi in a northern Wyoming sagebrush community. The latter isolates, RMF 2050, 2178, and 2110, differ from RMF 99 in exhibiting some small radiate conidial heads and heads which have split into column segments, and RMF 2110 has comparatively longer conidiophores and larger vesicles.



FIGS. 1-6.

Repeated monospore culturing of RMF 99 yielded an array of culturally aberrant strains and in one instance a color mutant developed as a sector from the parent colony. Sterile colonies obtained as monospore subcultures commonly produced abundant and often strikingly irregular sclerotia; fertile colonies commonly produced a dense stand of conidiophores which became covered by a floccose overgrowth, the development of sclerotia was retarded, and a brown staining of the reverse and wrinkling of the mat accompanied the areas of fertile growth (FIG. 2). Other monospore subcultures were characterized by a deep yellow to orange reverse color which remained constant with successive transfers. The color mutant which developed as a sector produces bright golden-yellow conidia; the colony is up to 5 mm deep on Czapek's agar and does not produce sclerotia.

Aspergillus leporis is clearly related to members of the *Aspergillus flavus* group as defined by Raper and Fennell (1), its only anomalous character being the yellow-pigmented conidiophore wall. It resembles *A. flavus* var. *columnaris* Raper & Fennell (1) in its possession of tightly columnar conidial heads, but differs in surface color, conidiophore size and morphology, and in its production of sclerotia. The sclerotia of *A. leporis* resemble those formed in a few typical strains of *A. flavus* (1). *A. leporis*, *A. subolivaceus* Raper & Fennell, and *A. avenaceus* G. Smith are similar in being predominately biserial with ecru-olive conidial heads, and in consistently producing large, dark sclerotia; the latter species differ from *A. leporis*, however, in form of the heads, conidiophore dimensions, and form and size of the conidia. *Aspergillus alliaceus* Thom & Church and certain strains of *A. tamarii* Kita also produce elongate, white-tipped sclerotia, but differ markedly from *A. leporis* in morphology and cultural characteristics.

SUMMARY

A new species in the *Aspergillus flavus* group, *Aspergillus leporis* States & Christensen, is described. It is characterized by compactly columnar conidial heads, sterigmata commonly biserial in arrangement, and sclerotia which are dark-colored, vertically elongate, and often

FIGS. 1-6. *Aspergillus leporis*, RMF 99. 1. Ten-day-old colonies on Czapek's agar. 2. A cultural variant on Czapek's agar at ten days (see text). 3. Conidial head showing globose, thick-walled vesicle with biserial sterigmata and globose conidia, $\times 1070$. 4. Uniserial conidial head, $\times 1070$. 5. Spore chains in tight columns which are deciduous as a unit, $\times 11$. 6. Portion of colony showing characteristic large, irregular sclerotia, $\times 2.3$.

irregular. The type culture was isolated from the dung of white-tailed jack rabbit (*Lepus townsendii*).

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