



Morphology identification for molds

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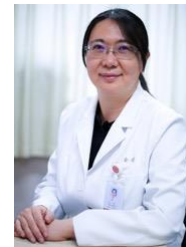
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- Department of Dermatology, Peking University First Hospital
- Peking University Research Center for Medical Mycology

Morphological Identification for Filamentous Fungi

Yu Jin

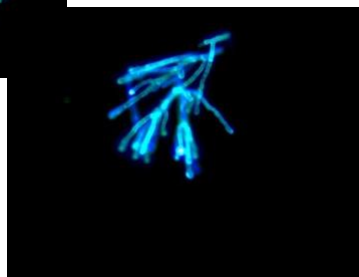
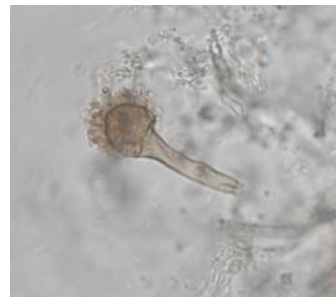
Morphology of filamentous fungi

- Morphology under microscope
- Colony morphology after culture
- Microscopic morphology after culture

Morphology of some pathogenic filamentous fungi

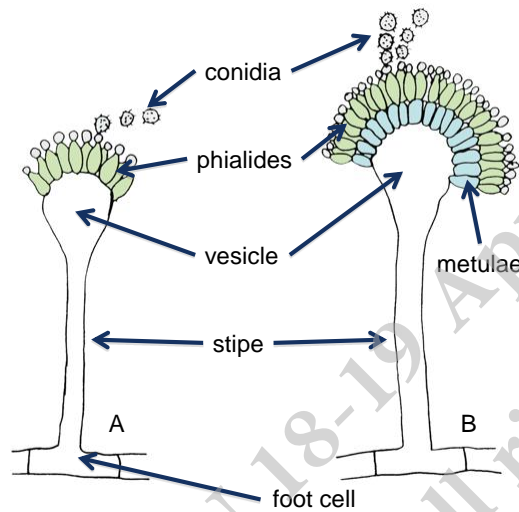
- Dermatophytes (*Trichophyton*, *Microsporum*, *Epidermophyton*)
- *Aspergillus* (*Aspergillus fumigatus*, *Aspergillus flavus*, *Aspergillus nidulans*, *Aspergillus terreus*, *Aspergillus niger*)
- Mucorales (*Mucor*, *Rhizopus*, *Rhizomucor*, *Cunninghamella*, *Syncephalastrum*)
- Dermatiaceous fungi (*Scedosporium*, *Exophiala*, *Phialophora*, *Cladophialophora*.....)
- *Fusarium*
- Dimorphic fungi (*Talaromyces marneffeii*, *Sporothrix*.....)

Aspergillus-microscopic examination

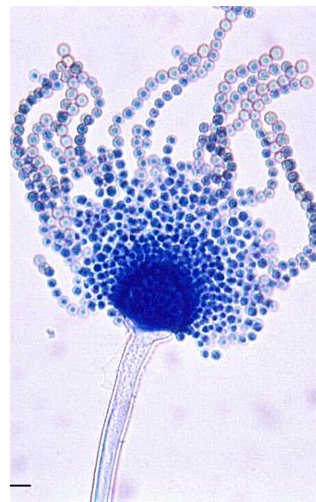


Conidial heads of *Aspergillus*

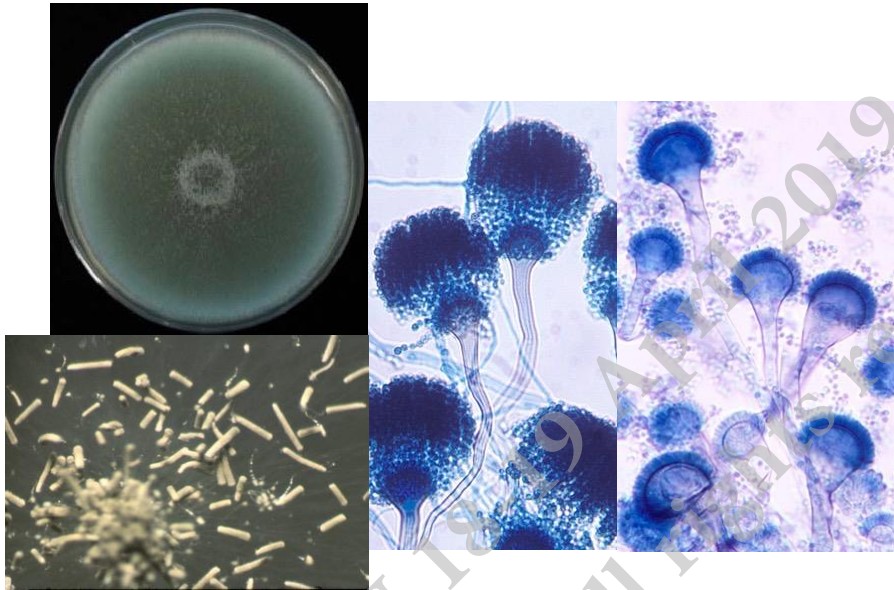
(a) uniseriate, (b) biseriata.



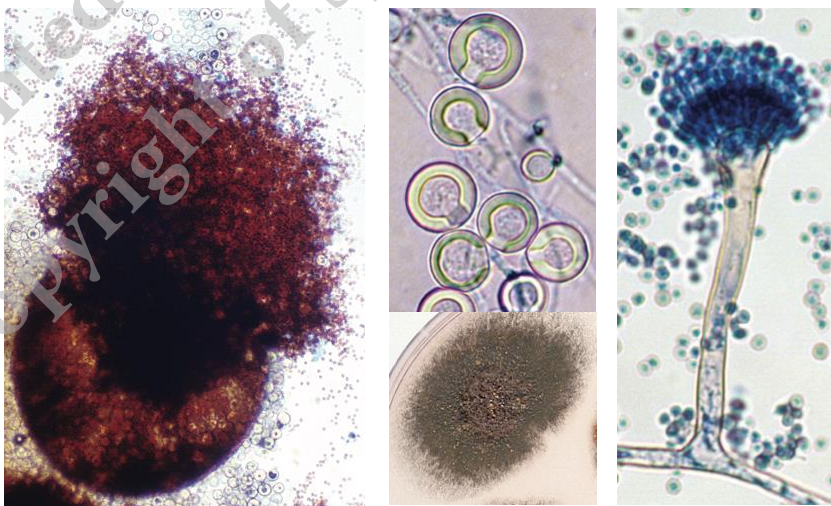
Aspergillus flavus



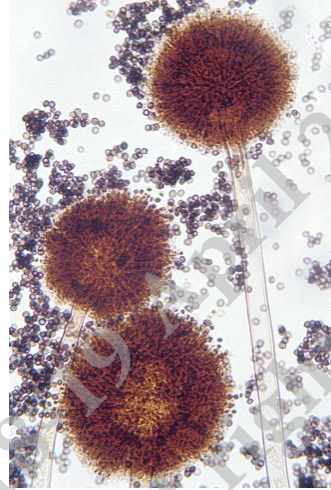
Aspergillus fumigatus



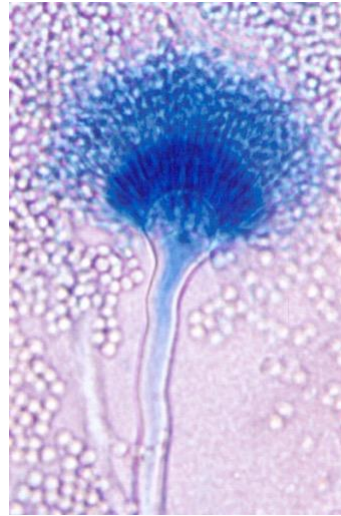
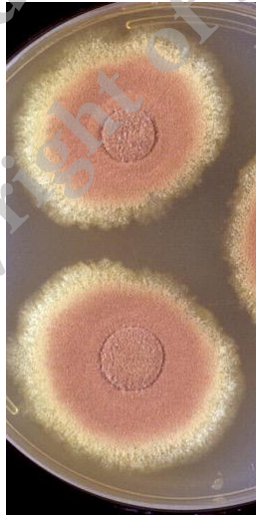
Emericella nidulans (anamorph *Aspergillus nidulans*)



***Aspergillus niger* complex**



Aspergillus terreus



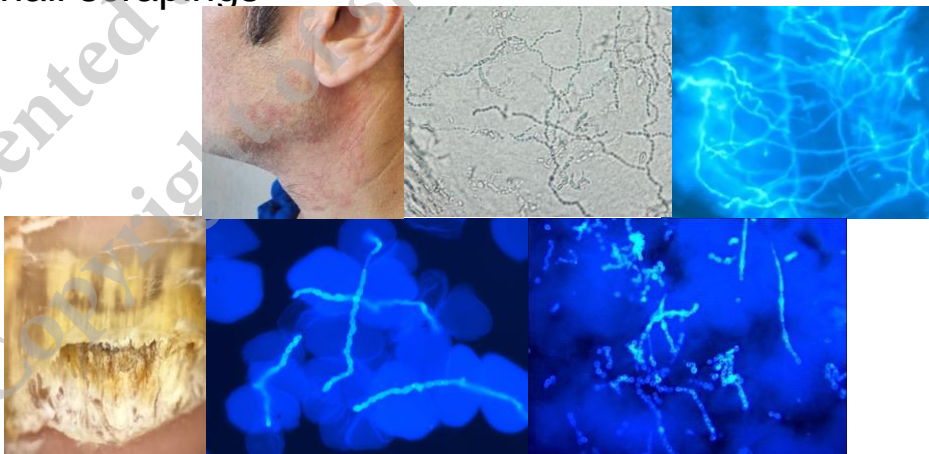
Aspergillus

- Isolation sites: sputum、BALF、secretion of nasal sinuses、secretion of ear canals、urine、brain、bone、eye、skin、nail etc.
- Microscopic examination: branched septate hyphae with 45° angle
- Colony morphology: MEA、PDA-color
- Under microscope: conidial heads of *Aspergillus*

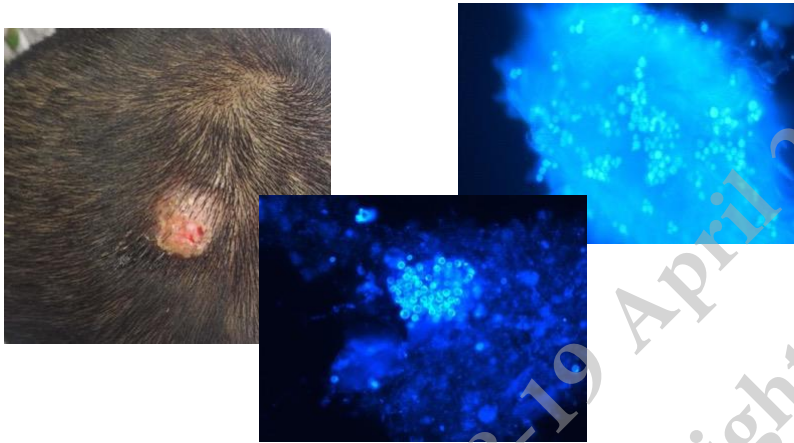
Dermatophytes-microscopic examination

-scurfs

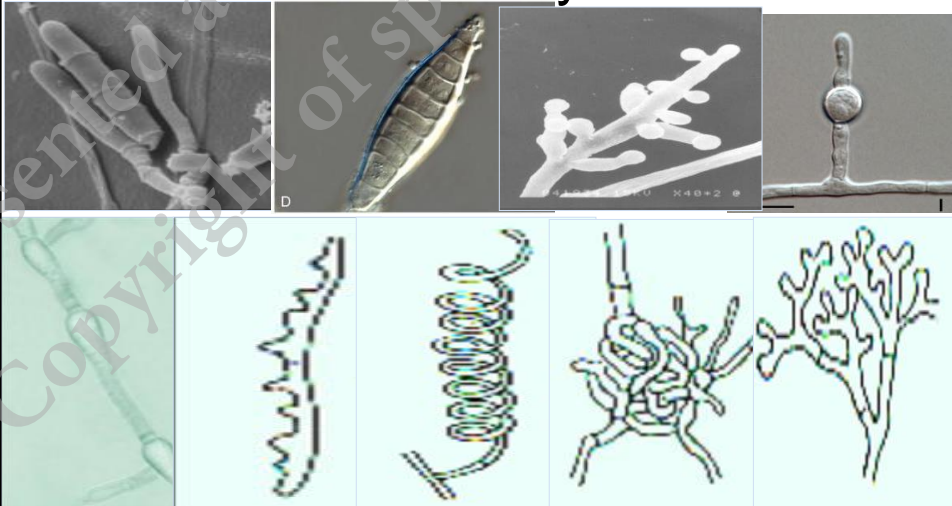
-nail scrapings



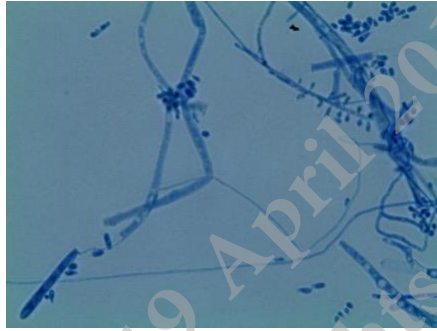
Dermatophytes-microscopic examination of hair



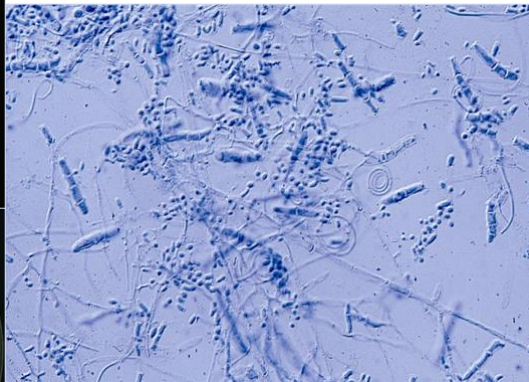
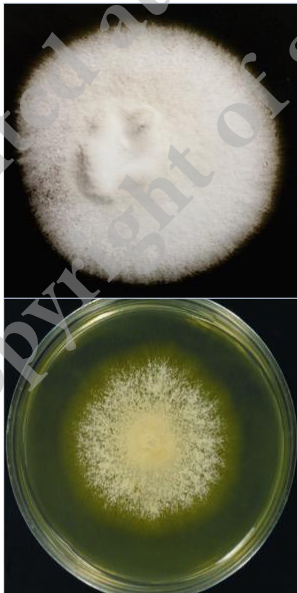
Morphological features of dermatophytes



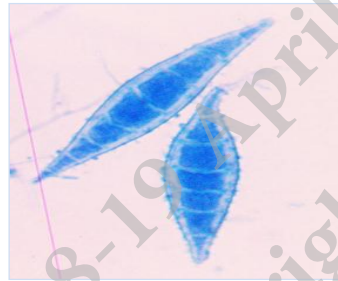
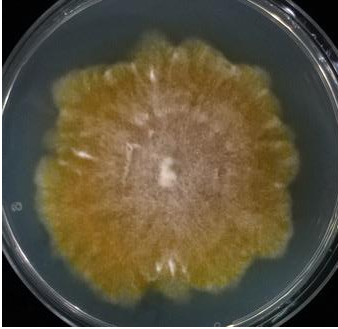
Trichophyton rubrum



Trichophyton interdigitale



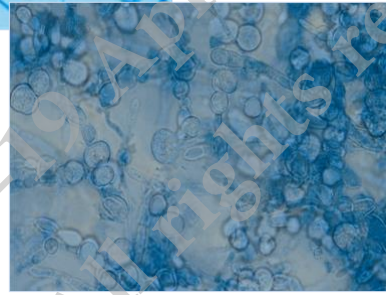
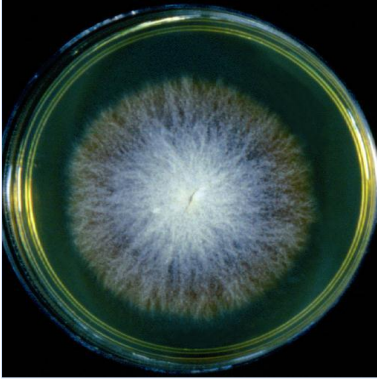
Microsporium canis



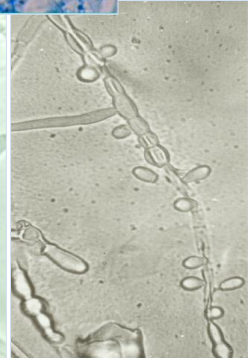
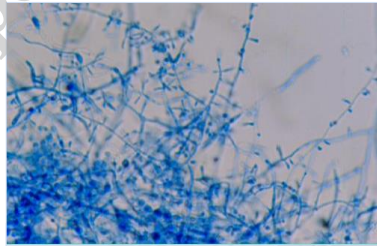
Microsporium gypseum



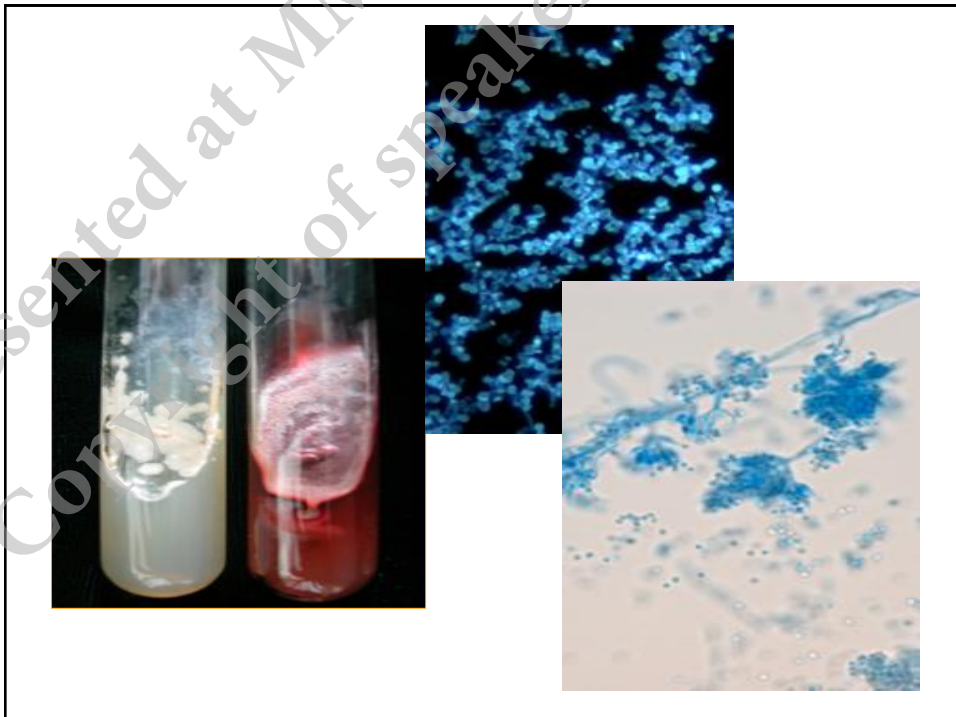
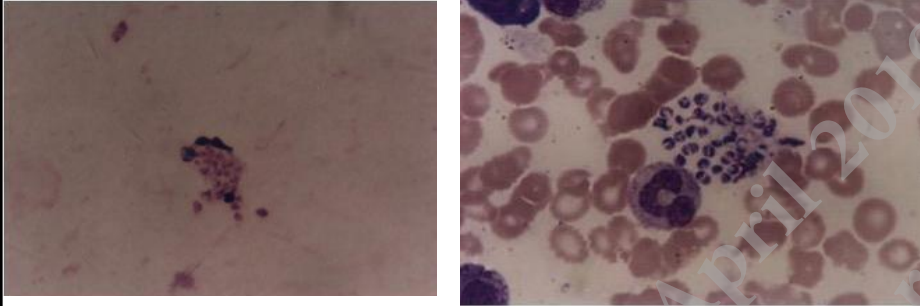
Epidermophyton floccosum



Trichophyton tonsurans

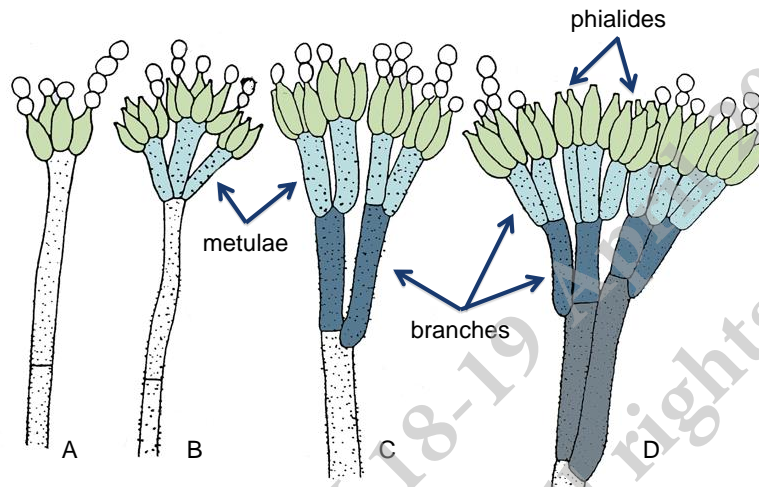


Talaromyces marneffe-
microscopic examination



Penicillium species

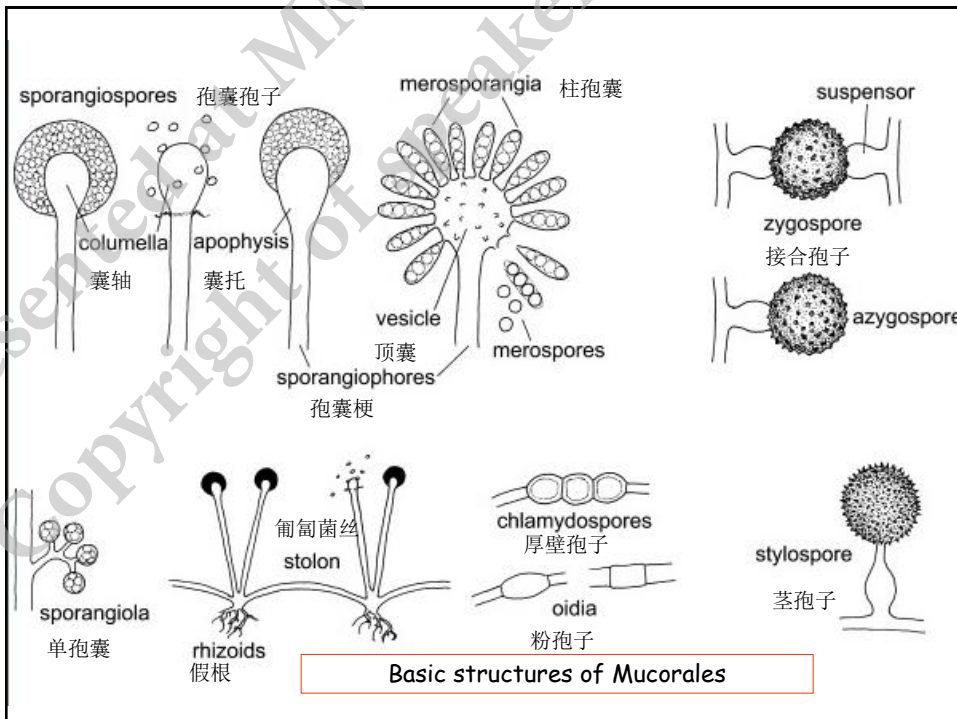
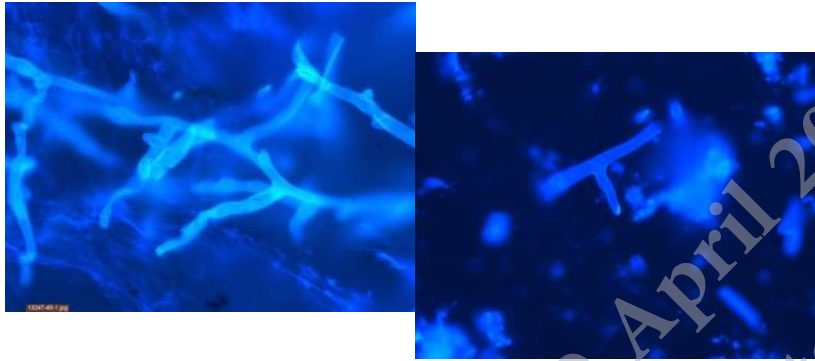
Branching patterns of conidiophores (a) simple; (b) monoverticillate; (c) biverticillate; (d) terverticillate

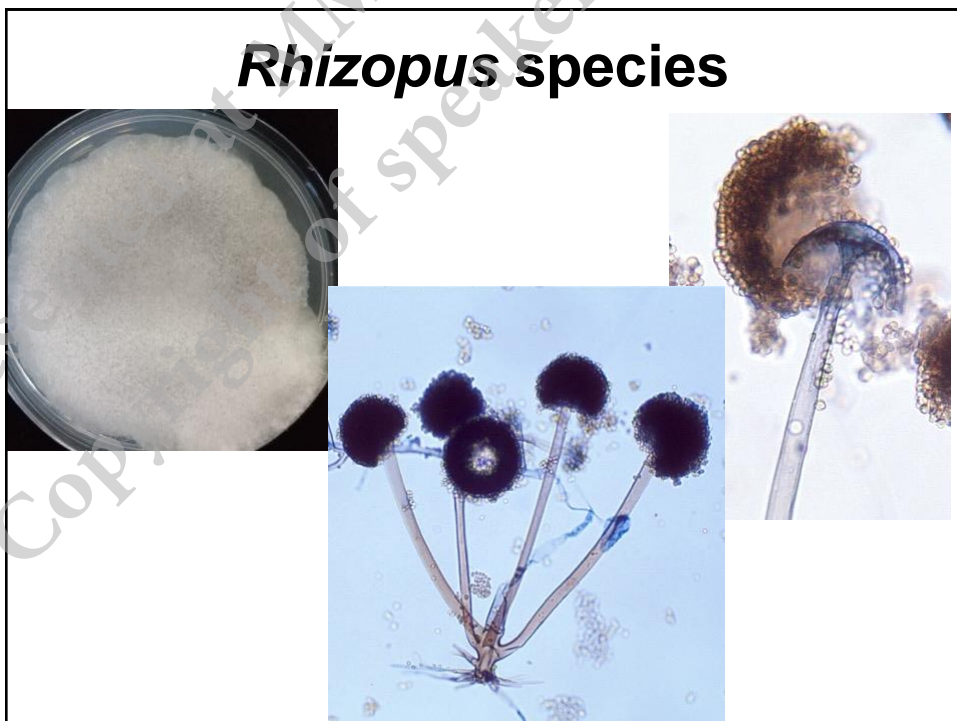
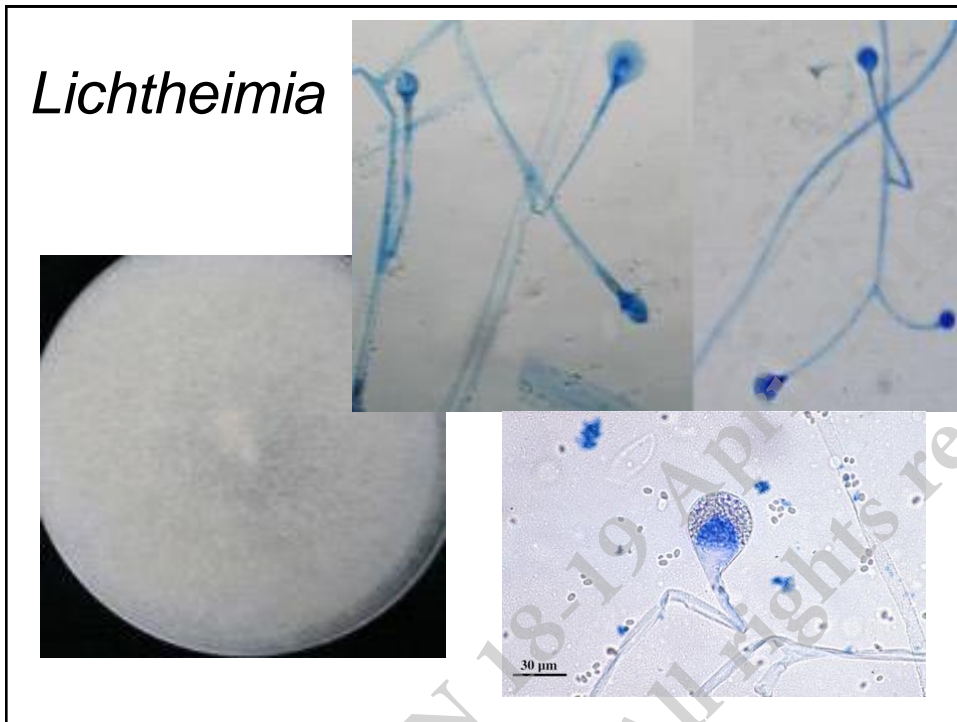


Main points for *Talaromyces marneffe* identification

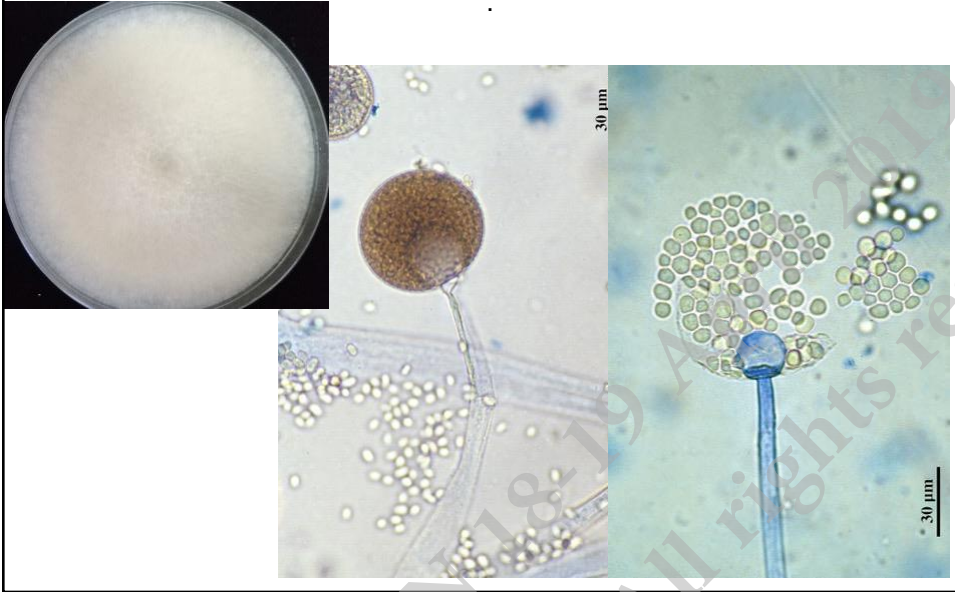
- Common isolation sites: pus, bone marrow, BALF, blood, bone, brain, joint fluid, skin, urine
- Microscopic examination : sausage-shaped spores with scars
- Bimorphic: 37 °C yeast phase, 28 °C hyphae phase (red pigment)
- Morphology: penicillus

Mucorales-microscopic examination

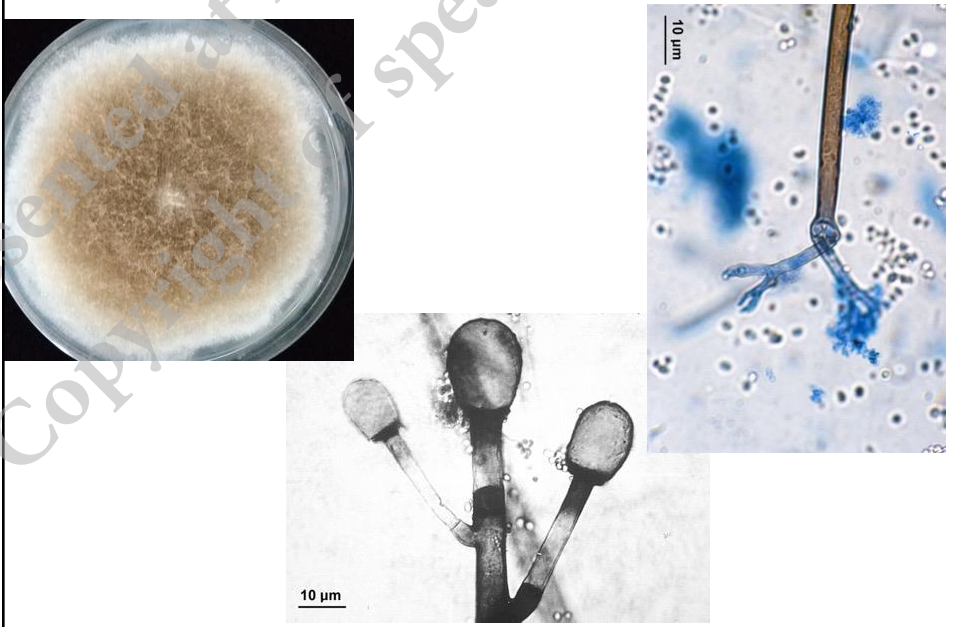




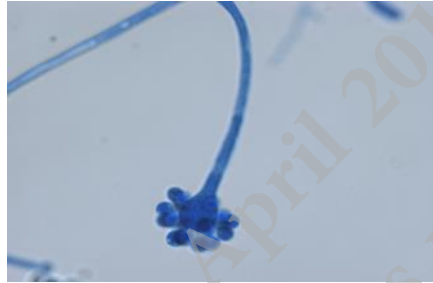
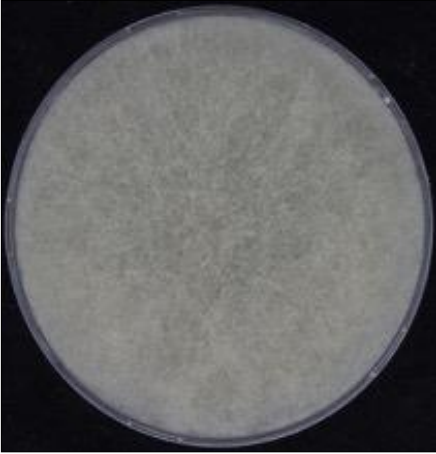
Mucor species.



Rhizomucor pusillus



Cunninghamella echinulata



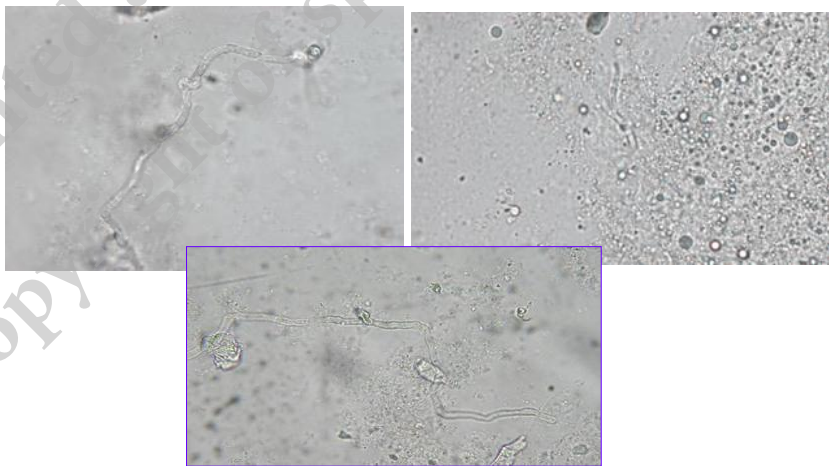
Synccephalastrum



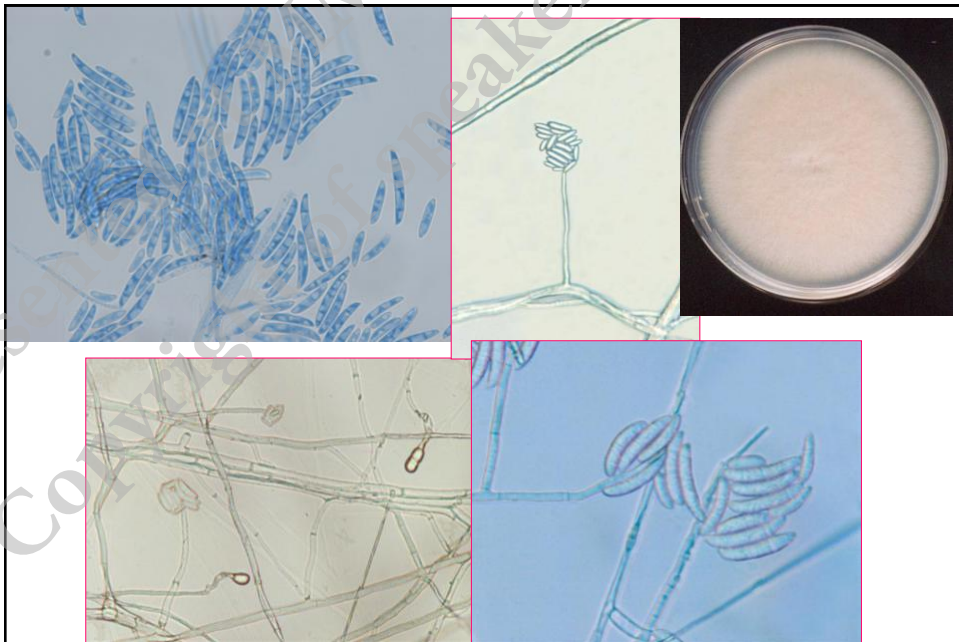
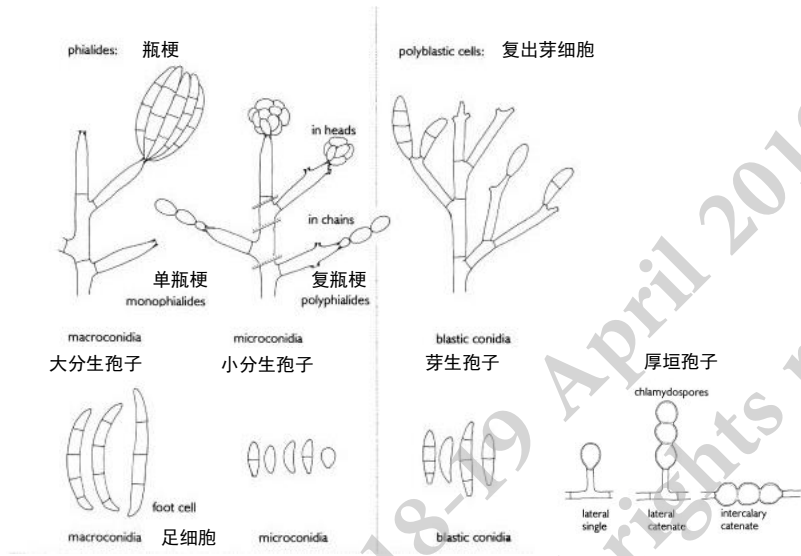
Main points for *Mucorales* identification

- Isolation sites: necrotic tissue, nasal sinus, pulmonary tissue, skin, bone, brain, eye
- Microscopic examination: wide, nonseptate or scattered-septate, 90° branched hyphae
- colony: difficult to culture, grey and villous, grow fast
- Under microscope: sporangium, rhizoid

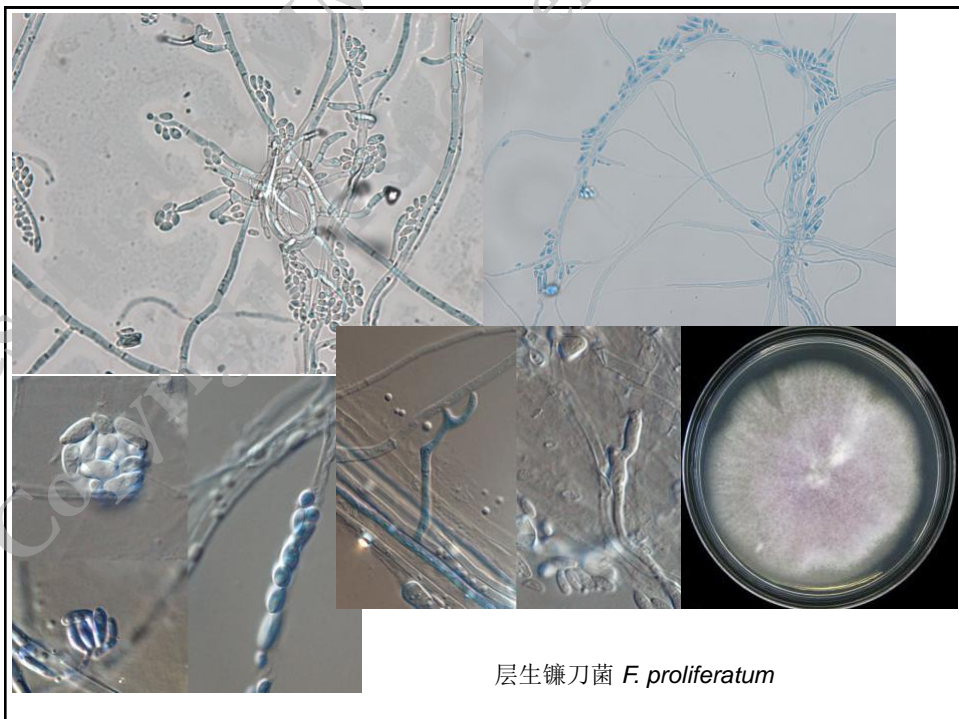
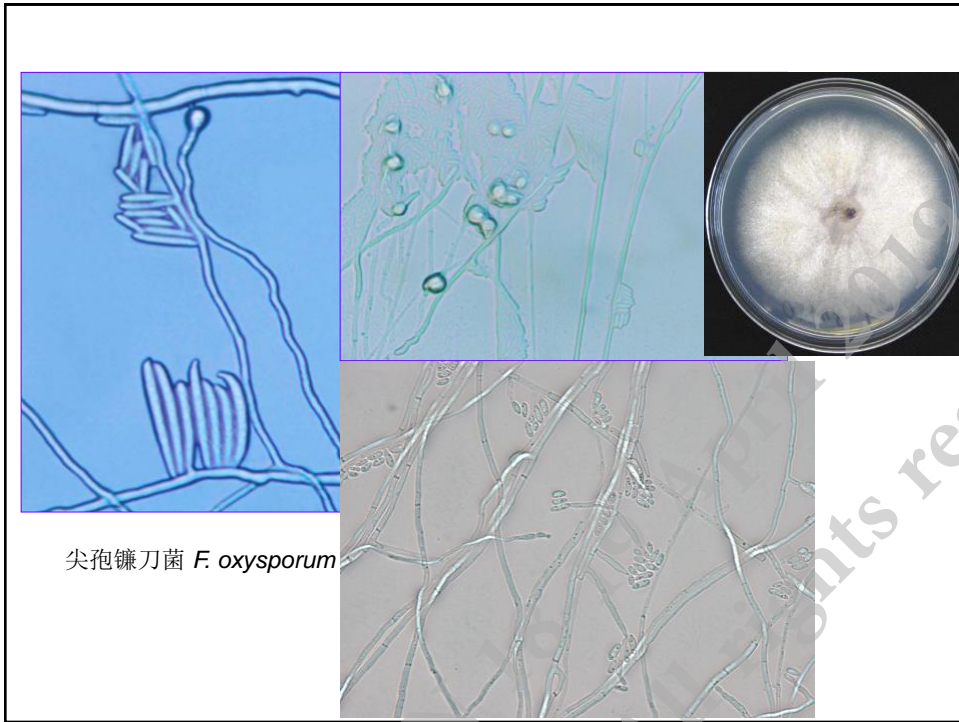
Fusarium-microscopic examination

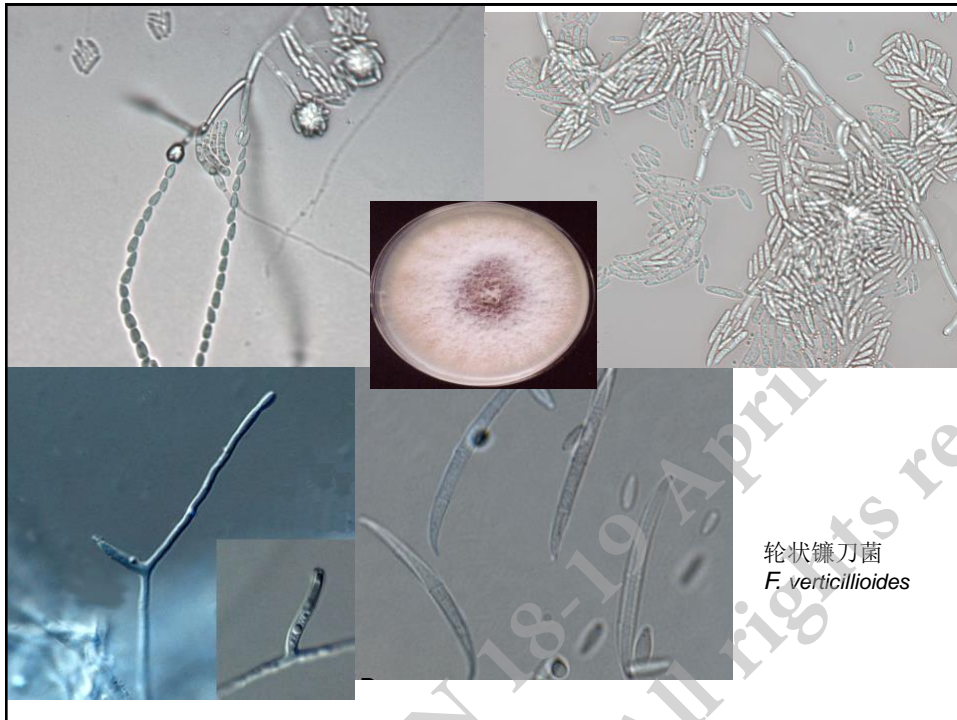


Morphological features



茄病镰刀菌 *Fusarium solani*



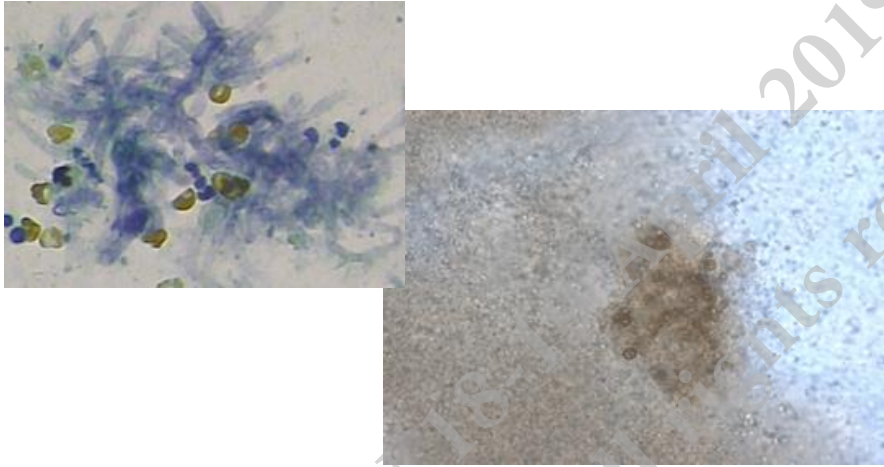


Main points for *Fusarium* identification

- Isolation sites: skin, nail, cornea, nasal sinus, lower respiratory tract specimens, blood, joint fluid, bone marrow, brain
- Microscopic examination: hyaline hyphae
- Colony features: mildew like colonies with multiple colors
- Under microscope: macroconidia-falcate

Scedosporium

(*Pseudallescheria boydii*) -
microscopic examination

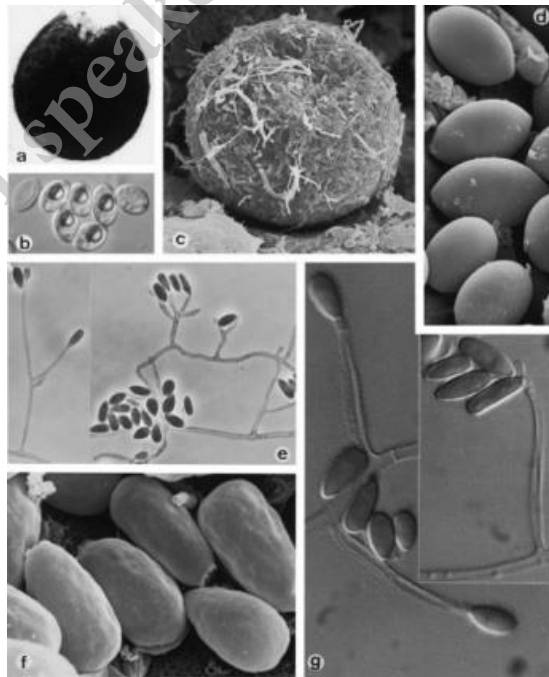


Morphological features

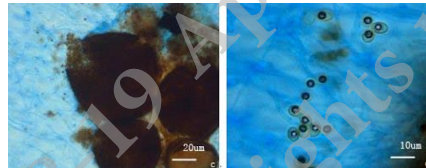
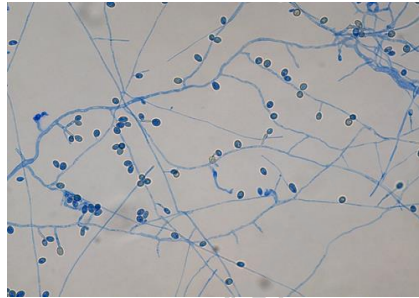
ascocarp
Sexual structure

ascospore

conidiophores and
conidiospores
Asexual structure



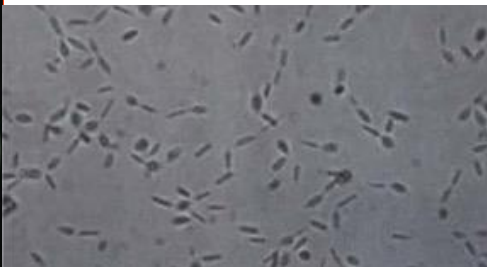
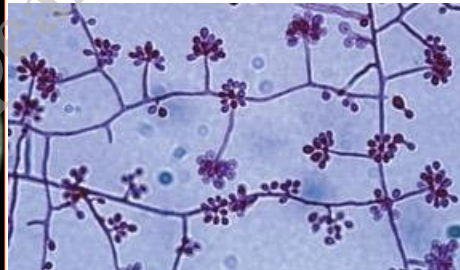
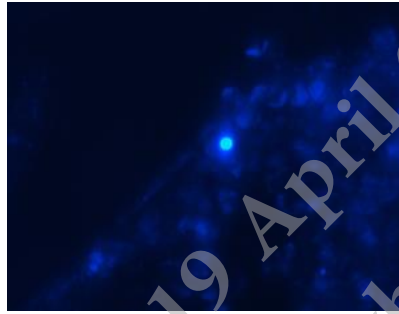
Scedosporium



Main points for *Scedosporium* identification

- Isolation sites: blood、cerebrospinal fluid、bone marrow、eye、sputum、BALF、skin etc.
- Microscopic examination: hyaline hyphae、dematiaceous spores in cavities
- Colony features: greyish-white, cotton- and wool-like
- Under microscope: conidiospores, some can generate ascocarps

Sporothrix-microscopic examination



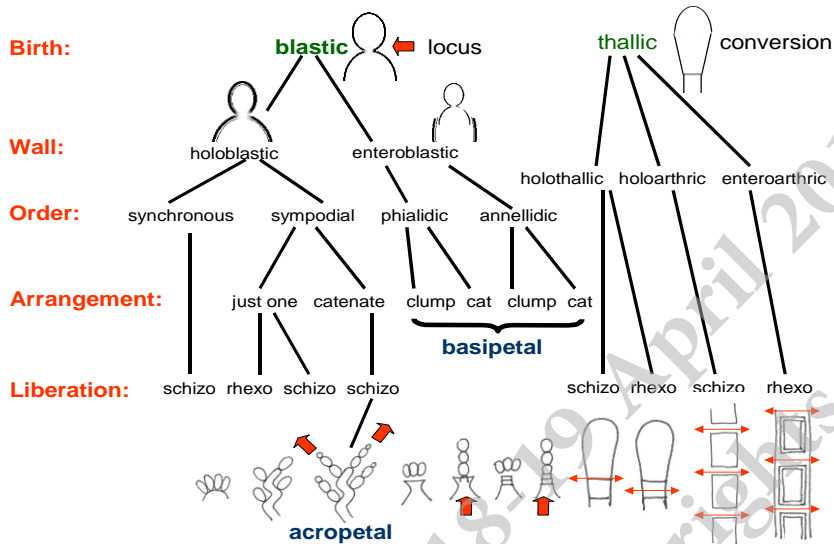
Dematiaceous fungi—chromoblastomycosis
microscopic examination



Dematiaceous fungi-phaeohyphomycosis
microscopic examination

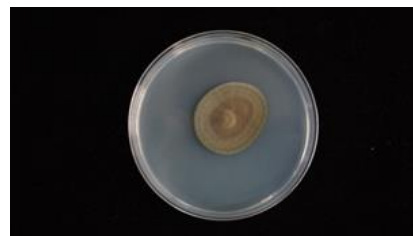
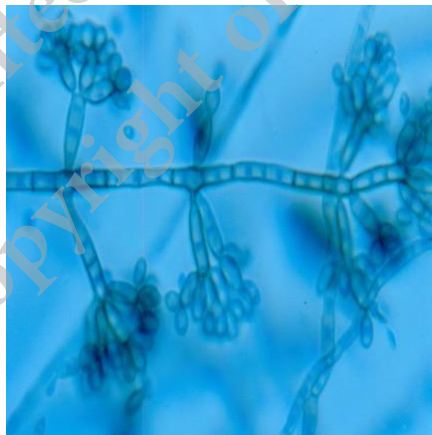


孢子发生 (conidiogenesis)

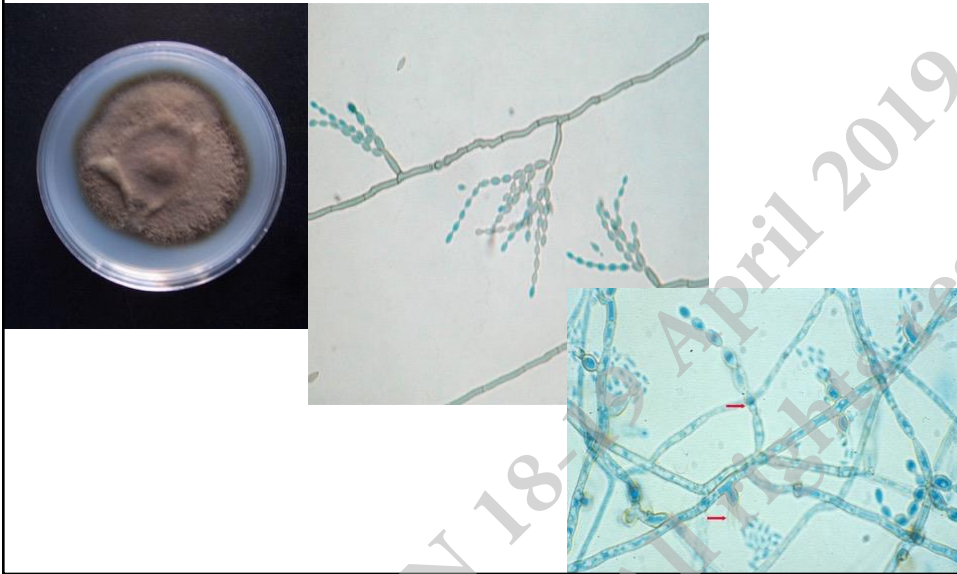


Sybrén de Hoog, et al. "Atlas of Clinical Fungi" 2011.

Fonsecaea pedrosoi—sympodial sporulation



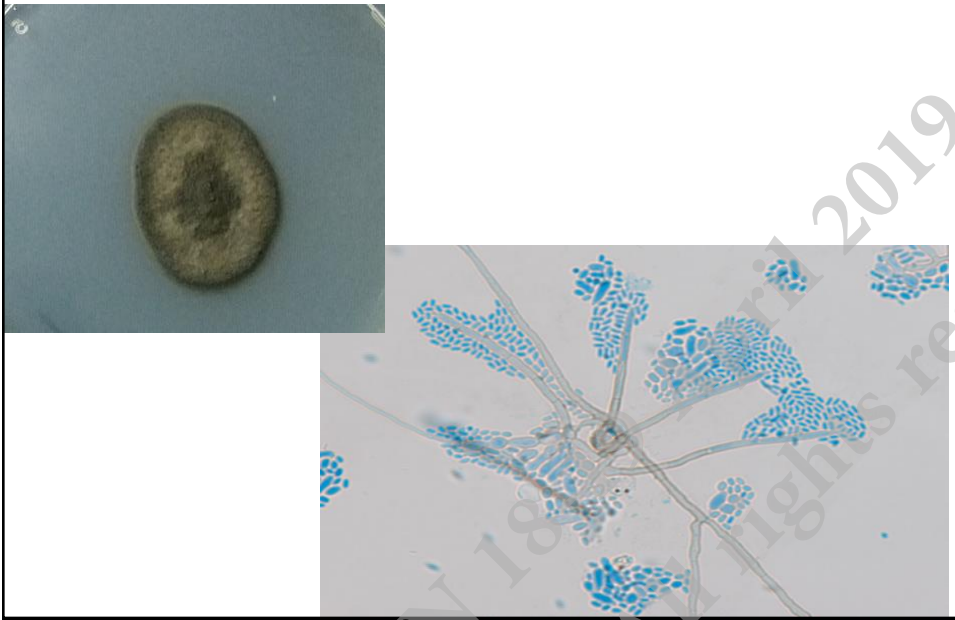
Cladophialophora carrionii



Phialophora verrucosa—phialidic sporulation

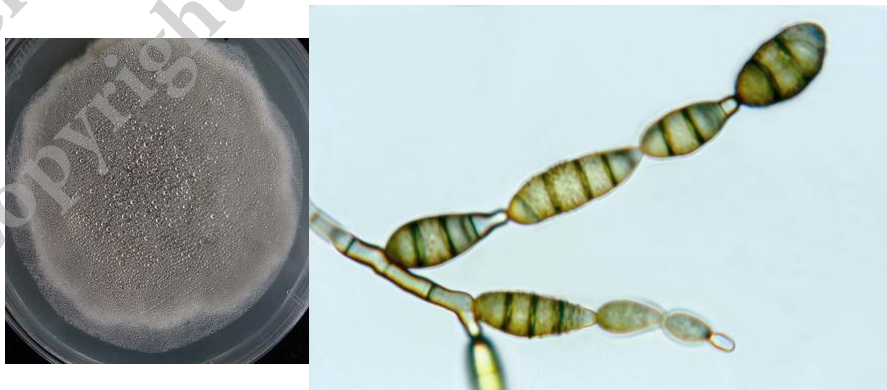


Exophiala spinifera

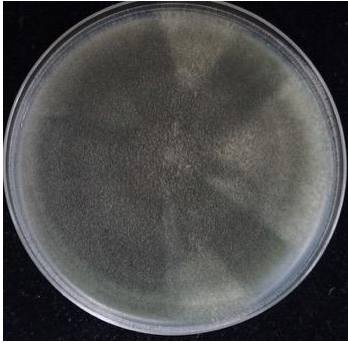


链格孢霉

(*Alternaria alternata*)



Curvularia lunata



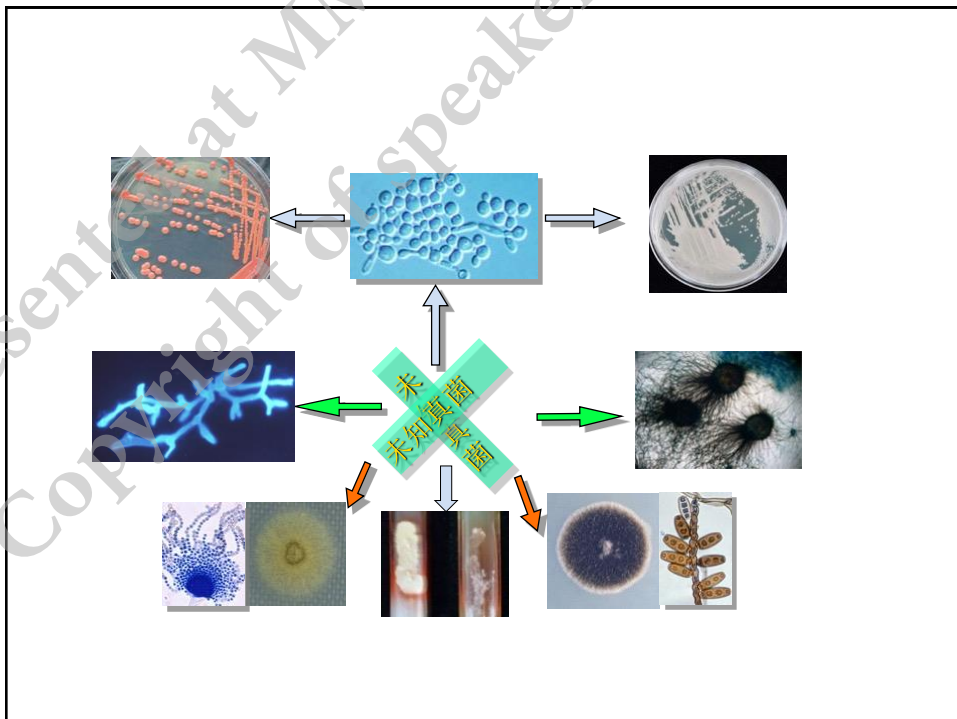
穗状离蠕孢

Bipolaris spicifera (Bain) Subran, 1964



Main points for dematiaceous fungi identification

- Isolation sites: soft tissue of skin、nasal sinus、deep tissue (brain)
- Microscopic examination: sclerotic cell、or dematiaceous hyphae
- Colony features: balck yeasts like、or dematiaceous villous
- Under microscope: macroconidia、sporulation



Thank you

Presented at MMTN 18-19 April 2019.
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