Generalized Fungi Imperfecti Rules

1. Form-generic names apply only to the state/morph represented by their type-species and not to any other of its morphs.
2. Form-genera are not mutually exclusive
3. Form-genera are not directly assignable to taxa of sexual/teleomorphic fungi
4. The nomenclature of the “higher fungi” is independent of the nomenclature of the form-gene
5. Although not a rule, it is most informative in today’s world to refer to fungi according to their taxonomic or morph affinities; i.e., the anamorphic name of ascomycete/plectomycete *Ajellomyces capsulatus* is *Histoplasma capsulatum*.

Generalized Fungal Life Cycle

1. Period of vegetative growth (colonization and substrate exploitation)
2. Period of asexual reproduction (often called anamorphic phase* of fungal life cycle)
3. Period of sexual reproduction (often called the teleomorphic phase of fungal life cycle)

*Often the basis for the most common name of a fungus (its anamorphic name), because discovered and/or observed first.

Importance of Spores

A. Biological

1) allow for dissemination
2) allow for reproduction
3) allow for survival

B. Practical

1) rapid identification*,**, (also helps with classification)
2) source of inocula for human infection
3) source of inocula for contamination

* of both anamorphs and teleomorphs
**however, may soon be replaced by use of molecular biology (PCR-based) technology, which doesn’t require an expert.

Kinds of Fungal Spores

1. Mitospores - chromosomal complement directly from mitosis
2. Meiospores - chromosomal complement more or less from meiosis
3. Karyospores - chromosome complement derived more or less directly from zygote nuclei

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Fungal Spore Types

1. endogenous mitospores* - encysted zoospores of fungal-like protists and Chytridiomycota and sporangiospores of Zygomycota

2. exogenous mitospores* - conidia, blastospores, teliospores**, etc. of Ascomycota, Basidiomycota, Fungi Imperfecti

3. endogenous meiospores+ - ascospores of Ascomycota

4. exogenous meiospores+ - basidiospores of Basidiomycota

5. karyospores+ - zygospores, oospores, resting spores and resting sporangia of Zygomycota, Oomycota & Chytridiomycota respectively

6. chlamydospores* - vegetative units that attain spore-like characteristics (dormancy qualities).

asexual
**N+N
+ sexual
Hyphomycetes & Coelomycetes Identification

Saccardo ~ 1880 devised the first practical scheme for identifying fungi based on structure (morphology) of the conidium. "Sylloge Fungorum IV"

Vuillemin ~ 1910 observed that asexual reproductive cells (spores) were produced by two different basic processes:

1) from conversion of pre-existing hyphal units to spores "Thallospores"*
2) blastic (budding) mechanisms = "conidia"

*mostly also called conidia today. e.g. thalloconidia & blastoconidia.

Taxonomic Systems for Identification of the Anamorphs of Conidiogenous Fungi

**The Hughes-Tabaki-Barron system (~1968+)**
- based primarily on mechanism of conidium development

**Ellis (Cole, Kendrick & Sampson) Systems (~1971+)**
- based on both mechanisms of conidium development & conidiophore development (combination of all earlier systems)