



Figure 2. Life cycle of *N. crassa*. Half of the sexual spores (ascospores) are mating type A (red) and half are mating type a (blue). Sexual spores (ascospores) and vegetative spores (conidia) germinate and form mycelia, from which asexual fruiting bodies (conidiophores) emerge. Conidiophores form conidia, which are typically multinucleate. In response to nitrogen starvation, mycelia of either mating type form specialized female structures called protoperithecia. Vegetative tissue (e.g., a conidium) of the opposite mating type serves as the “male” to fertilize and initiate development of fruiting bodies (perithecia). After fertilization, male- and female-derived nuclei coexist in the same cytoplasm, where they undergo mitoses and eventually become organized into a dikaryotic tissue in which each cell has one nucleus of each mating type. The nuclei then pair and undergo a series of synchronous mitoses until the tip of the hyphal cell in which they reside bends to form a hook-shaped cell called a crozier. Fusion of haploid nuclei is immediately followed by meiosis and a mitotic division such that one crozier gives rise to one ascus containing eight ascospores. The approximate stages in which the epigenetic processes described in the text occur are indicated.