

Why "Red bread mold" is an inappropriate name for *Neurospora*

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The common names "red bread mold" and "bread mold" are inaccurate and misleading. They should be abandoned.

If an organism is already well known to the public before scientists adopt it for research, the popular, vernacular name usually continues to be used. Examples are *yeast* for *Saccharomyces*, *mouse* for *Mus*, *corn* for *Zea mays*, and *silkworm* for *Bombyx*. These common names are well established, and users are generally comfortable with them. However, some widely used research organisms happen to have acquired popular names that are clearly inaccurate or misleading. Such has been the fate of *Drosophila* and *Neurospora*.

Melvin Green (2002) has protested the use of "fruit fly" for *Drosophila*, pointing out that the name does not apply for the many *Drosophila* species that use substrates other than fruit, and that it leads to confusion with the Mediterranean fruit fly, a serious agricultural pest. He urges that the popular name *fruit fly* be abandoned and that the scientific name *Drosophila* be used in all scientific literature and in textbooks.

As with the name *fruit fly* for *Drosophila*, objection can be made to using *red bread mold* for *Neurospora*. The vernacular name is imprecise and misleading in two respects, regarding both color and substrate. As to color, homothallic *Neurospora* species are devoid of conidia and of visible carotenoid pigments, while *N. crassa* and other conidiating species, which do display carotenoids, are orange or yellow-orange rather than red. When dark-grown cultures of a conidiating *Neurospora* species are first brought into the light, they are colorless. Then, within an hour, they become pigmented. The initial blush of color is pink or red, but this is quickly transformed to orange. The ephemeral red stage, which is rarely seen and is probably unknown to most observers, seems a poor choice for naming the organism.

As to substrate, *Neurospora* existed for millions of years on natural substrates, in the absence of human artifacts. Calling *Neurospora* a bread mold might be considered an example of anthropocentric arrogance. Although *Neurospora* is able to grow profusely on bread, and was first recorded as a nuisance in bakeries (Payen 1843; see Perkins 1991), its occurrence is rare compared to other contaminating molds, especially since antifungal agents were introduced and bakery sanitation was improved. I have myself seen many examples of moldy bread that was black or green, but never one that was orange or red.

Unfortunately, the vernacular name *red bread mold* was used by Shear and Dodge in the title of the classic 1927 paper in which they first described the sexual phase and named the genus. Dodge continued to use the term, as for example in 1952: "*The old red bread-mold has at last come into its own.*" Although the term has largely fallen out of use in the primary scientific literature, it persists in popular writing and in textbooks. (A Google search finds hundreds of entries having "*bread mold*", "*red bread mold*", or "*pink bread mold*" associated with "*Neurospora*" in the same document.)

Shear and Dodge had precedence for calling the mold red. Already in the first published account of *Neurospora* (then called *Oidium*), Payen (1843) used the terms "champignons rouges" and "champignon de couleur rouge-orange". Their terminology is understandable because they observed pigment development at the transition stage, in colonies that had just been moved from dark to light (see colored plate from Payen, reproduced as Figure 1 in Borkovich *et al.* (2004).

Green (2002) asks the question "Should common usage override biological precision?" Although use of *red bread mold* by journalists and others in the popular press may seem inconsequential, it is imprecise and misleading. The professional biologist, for whom precision is important, should set a good example by avoiding use of the terms *bread mold* or *red bread mold*. In contexts where the simple name *Neurospora* does not suffice and a descriptive vernacular term is needed, an alternative such as *orange mold* or *filamentous fungus* should be used.

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