

SECALE CORNUTUM IS A FUNGAL CONDITION**Will H. Blackwell**Biological Sciences, The University of Alabama,
Tuscaloosa, AL 35487, USA**ABSTRACT**

Secale cornutum, a name attributed to Nees but introduced into the literature earlier by Richard, would seem to be a name applicable to a species of the grass genus *Secale* (containing cultivated rye). However, examination of original literature and illustrations indicates that various authors involved were primarily attempting to discuss an ascomycetous fungus—what we now know to be *Claviceps purpurea* (ergot). After review of this information, it appears that use of the name *Secale cornutum* perhaps best served simply to describe the “spurred” appearance of cultivated rye spikes infected with ergot, i.e., exhibiting sclerotia or “ergot bodies.” Fortunately perhaps, the name *Secale cornutum*, when apparently first formally introduced into the literature, was invalid.

KEY WORDS: Eclectic medical, ergot, infected, rye, sclerotia, *Secale cereale*.

The Eclectic Medical Movement in latter 19th century America—historically centered in Cincinnati, Ohio (Lloyd and Lloyd, 1910; Taylor, 1942)—emphasized specific botanical medicines, often with active alkaloid content. In pursuing some readings on this movement, I came across an unusual name for ergot, i.e., a name other than the correct Ascomycete name, *Claviceps purpurea* (Fries) Tulasne (or one of its fungal synonyms). Known for centuries as a plant disease (Davenport, 2005), ergot became especially noteworthy as the probable mind-altering agent (in contaminated rye cake) in the infamous Salem, Massachusetts witchcraft trials of the 1690s (Caporael, 1976). The ergot alkaloids are known not only to affect the nervous system, but to be powerful vasoconstrictors as well (Davenport, 2005). It makes sense, thus, that ergot was employed medicinally by Eclectic doctors (in the late 19th and early 20th centuries) as a spinal stimulant and,

particularly, to induce labor while controlling hemorrhage at the same time. In the writings of John Scudder (1870), a leading Eclectic physician and promoter of the “Eclectic School” in Ohio, the name for ergot is given as “*Secale cornutum*.” This name also surfaced at a similar time in the literature of plant pathology, e.g., Rivolta (1873)—in the latter case *Secale* was misspelled as “Segala” (given as “Segala cornuta” in Rivolta’s publication). Regardless of spelling, *Secale* is of course the genus name to which cultivated rye belongs, viz. *Secale cereale*. So, I wondered, were writers such as Scudder and Rivolta referring to ergot, unquestionably a fungus, as if it were a grass—as if it were a species of the genus to which cultivated rye belongs?

Use of the name *Secale cornutum* persisted for a time, seemingly in an accepted fashion. One may note, for example, the reference to ergot in *The Pharmacopoeia of the United States of America* (9th revision, 1916) as “*Secale cornutum*” or “spurred rye.” *The Epitome of the Pharmacopoeia of the United States and the National Formulary with Comments* (1943) mentioned *S. cornutum* as “ergot of rye,” or “Ergota.” Schiemann (1948) indicated *S. cornutum* to be a “drug” [from ergot], of special significance in obstetric applications. Reference to ergot, in drug form, as “secale cornutum” was apparently not uncommon in early 20th century pharmacopoeias (Hatcher and Wilbert, 1915). However, confusion as to whether *S. cornutum* represented ergot, rye, “altered” rye, a possibly different species within the rye genus, a medication, or even something else, became apparent as I continued to explore such references. Obviously, some deeper detective work was in order.

In his scholarly index to botanical illustrations, Pritzel (1855) listed *Secale cornutum*, crediting Nees (1833) as the source of origin of the original illustration (Fig. 1) and, seemingly, the name as well. Pritzel correctly cited Nees’ illustration #24 as applying to *S. cornutum*. *Index Kewensis* (original volumes) subsequently also listed *S. cornutum*, but mistakenly indicated Nees’ illustration #74, rather than #24, as applicable to this “species.” *Index Kewensis* attributed authorship of *S. cornutum* as “Offic. ex Nees”—however, “Offic.” apparently refers to part of the title of Nees’ publication (see Literature Cited, viz., “officineller”). *Index Kewensis* nonetheless appropriately equated the name *S. cornutum* to *Claviceps purpurea* (the correct name

for the ergot fungus), drawing attention to the awkward situation of the synonymy of a grass name and a fungal name. Chase and Niles (1963) gave the correct illustration (#24) for the Nees (1833) reference, but listed the 1866 edition of Pritzel's *Index*, rather than the 1855 edition in which the Nees reference was originally cited.

The only other authors mentioned by Pritzel (1855) in connection with *Secale cornutum*—these apparently given secondarily—are “Guimpel et Schl.” (“Schl.” = Schlechtendal). The Guimpel and Schlechtendal (1833) reference is contemporary with Nees (1833), and is not viewed as a prior publication. However, there are prior uses of the name *S. cornutum*. Nees himself (Nees & Ebermaier, 1830) employed the name three years prior to the reference (Nees, 1833) cited in Pritzel (1855). In the same year as Nees & Ebermaier, Geiger (1830) also gave *S. cornutum* as the name for “Mutterkorn” (ergot). The earliest mention of the name *S. cornutum* in the literature that I have found, however, is by Richard (1824). In Richard's (1824) work, *Secale cornutum* is listed as an “*altere nomen*” for “*Sclerotium clavus*” (= *Claviceps purpurea*, cf. Oudemans, 1919; Walker, 1969). If Richard's (1824) work proves to be, as it seems, the earliest appearance of the name *Secale cornutum*, then its first formal usage would be as a synonym—and the name can be dismissed as invalid on this basis (Article 34, *International Code of Botanical Nomenclature*). The earliest reference indicated by Nees (1833) is in fact Richard (1824). Since Richard considered *S. cornutum* merely an “alternate name,” one might wonder if some use of the name prior to Richard (1824) occurred in the literature. However, the French edition of Richard's work, appearing one year earlier (1823), does not include *Secale cornutum*. Perhaps any earlier use, i.e., before Richard (1824), was simply a part of oral tradition or correspondence. But, in any case, here the trail runs cold. Roshevitz (1947), in a monograph of *Secale*, did not pick up the name *S. cornutum*.

Although it is evident that Nees did not originate the name, the most substantial information available on *Secale cornutum* is still the Nees (1833) reference, complete with illustration (i.e., the reference selected by Pritzel, 1855, for citation). Pertinent here, however, is that it was not Nees' intent to describe a grass, but rather to describe a fungus. The fungus he was describing was of course ergot (*Claviceps*

purpurea), known then generally by the older name *Sphacelia segetum* (according to Hawksworth et al., 1983, the “teleomorph” of *Claviceps*—and to Kirk et al., 2001, as being “anamorphic *Claviceps*”). Nees (1833) was not describing the species *Sphacelia segetum* since, as he knew, both the genus *Sphacelia* and the species *S. segetum* had been previously described by L veill  (1827). What has seemingly escaped attention is that Nees was attempting to describe a variety of *Sphacelia segetum*, viz. *Sphacelia segetum* var. α *secalis*. Nees equated his variety of *Sphacelia segetum* to former names—*Sclerotium clavus* and *Spermoedia clavus* (these representing *Claviceps* or possibly related anamorphic forms; cf. Seymour, 1929; Clements and Shear, 1931; Walker, 1969; Kirk et al., 2001)—and, as well, to *Secale cornutum*. Nees indicated, though, that these former names referred (descriptively) more to the changed appearance of the ovaries of the rye plant than, specifically, to the fungus itself—hence, his rationale for describing *Sphacelia segetum* var. α *secalis*—an apparent attempt to clarify the situation. Perplexingly, *Index Fungorum* lists “f. [forma] *secalis*,” attributed with a “?” to “Krebs”—no date provided—but omits var. “ α *secalis*” of Nees.

In any event, careful scrutiny of Nees’ (1833) publication provides the answer sought. The name *Secale cornutum* was, albeit perhaps ill-advisedly, applied to the visible “condition” of cultivated rye grass when infected with ergot—a condition in which the dark, sometimes curved, beak-like sclerotia (resting bodies) of the ergot fungus have replaced the “grain” in a number of the grass florets. These “ergot bodies” are seen to occur intermittently—sometimes “spur-like” or “horn-like” in appearance—along the rye inflorescence (Fig. 1). The common name “ergot” is derived from the French *argot*, an allusion to the resemblance of the sclerotium to a “cock’s spur” (Wolf and Wolf, 1947). The epithet “*cornutum*” means “horned,” in reference to these same observed structures (sclerotia). The name *Secale cornutum* may, thus, be interpreted literally as “rye plants” seen to have these “horns” or “spurs”—in other words, rye plants contaminated or altered in this manner. Hence, the name *S. cornutum* has application, intent-wise at least, neither specifically as a species of rye, nor as a species of fungus—nor as a drug, for that matter. It refers primarily to the unusual physical appearance of the *infected* rye plant. As concerns nomenclature, we might nonetheless have to deal with the name (under

the rye genus, *Secale*, or the fungal genus, *Claviceps*) were it not for the fact that *S. cornutum*—based on knowledge at hand—may be viewed as an illegitimate name in either case, and disregarded as any sort of proper name. As discussed, the apparent initial appearance of the name in the literature was not taxonomically valid. Perhaps, designation as a *nomen invalidum* is, after all, the best nomenclatural repository for the name *Secale cornutum*.

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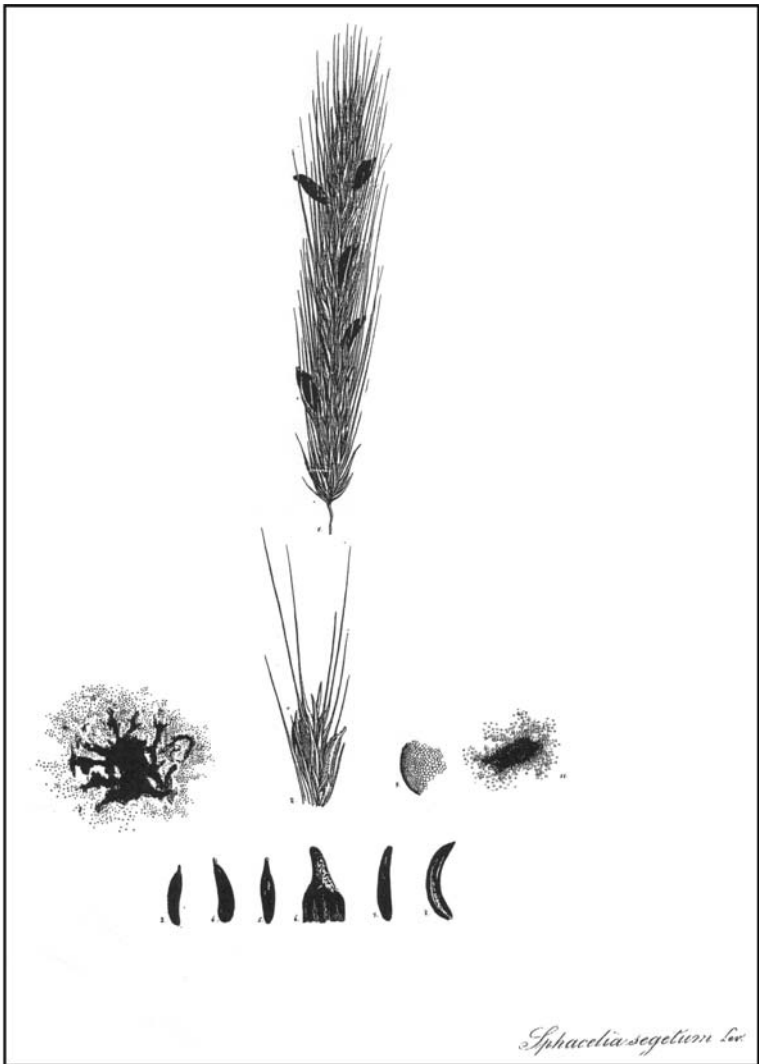


Fig. 1. *Sphacelia segetum* (alias *Secale cornutum*), from Nees (1833, illustration #24). We would now interpret this as *Claviceps purpurea* (ergot) on cultivated rye, *Secale cereale*.