Claviceps paspali and the Eleusinian *Kykeon*: A Correction

by Francesco Festi & Giorgio Samorini

In the second chapter of the book *The Road to Eleusis* (Wasson *et al.* 1978) Albert Hofmann answered the question proposed by R.G. Wasson regarding the possibility that the ancient Greeks would have been able to isolate a visionary drug from ergot that was capable of inducing an experience comparable to those produced by psilocybin or LSD. Hofmann's positive answer was based on three hypothesis.

The first hypothesis conjectured the separation from *Claviceps purpurea* (Clavicipitaceae)—parasitizing wheat and barley—of the water-soluble psychoactive and non-toxic alkaloids (belonging to the ergonovine group) from those responsible for the gangrenous and/or convulsive syndromes (belonging to the ergotamine/ergotoxine group). The third hypothesis conjectured the separation of the psychoactive alkaloids from the ergot (*C. purpurea*) of the infestant *Lolium temulentum* L. (Gramineae).

The second hypothesis, perhaps more suggestive and renowned, proposed the integral use of *Claviceps paspali* Stevens et Hall, whose sclerotia appears to exclusively contain the psychoactive water-soluble alkaloids. The host species hypothetically proposed by Hofmann was *Paspalum distichum* L., which "grows commonly all around the Mediterranean basin and is often infected with *Claviceps paspali*" (Hofmann 1978: 31). After a closer examination of the *data* on the corology (geography) of the *Paspalum* genus, this second hypothesis by Hofmann needs a correction, due to an ethnobotanical oversight, already forecasted by Rätsch (1998: 643).

The genus *Paspalum*, including 250 to 450 species (depending on what authority one cites) is spread in tropical and subtropical areas of the Old World and all over the New World. In fact, less then 10% of the species is native to Africa and/or Asia. No single species is indigenous to Europe, where the following species are present today (Clayton 1980: 263; Conert 1998: 36–37; Garbari 1972; Häfliger & Scholz 1985: 94–109):

Paspalum dilatatum Poiret in Lam. [= *P. pratense* Sprengel, *P. ovatum* Nees von Esenbeck ex Trinius, *P. lanatum* Sprengel, *Panicum dilatatum* (Poiret) O. Kuntze, *Digitaria dilatata* (Poiret) Coste]: originally from South America (Argentina and Brazil), it is sometimes cultivated as fodder and became wild or naturalized (in wet and shady uncultivated lands) in Portugal, Spain, Azores, Italy, Austria, and Germany.

Paspalum urvillei Steudel: originally from South America, naturalized in rice fields and wet areas of Portugal, but very likely to be found in other countries of Southern Europe.

Paspalum paspalodes (Michaux) Lamson-Scribner [= *P. distichum auct. non* L., *Digitaria paspalodes* Michaux, *P. digitaria* Poiret, *P. michauxianum* Kunth, *P. distichum* var. *digitaria* (Poiret) Hackel, *P. distichum* subsp. *paspalodes* (Michaux) Thellung]: originally from tropical areas of America, cultivated as fodder mainly in subtropical countries, by this time subcosmopolitan and still expanding (for example, it became spontaneous in Cornwall in the 1970s; cf. Sell & Murrell 1996: 239); naturalized in Portugal, Spain, Azores, Italy, France, Austria, Germany, Great Britain, Albany, Bulgaria, Greece, Turkey, and European Russia.

Paspalum racemosum Lamarck: originally from Peru and Ecuador, became wild in Germany.

Paspalum vaginatum Swartz [= *P. tristachyum* Leconte, *Digitaria tristachya* (Leconte) Schultes, *P. inflatum* A. Richard, *Panicum vaginatum* (Swartz) Grenier & Godron, *Digitaria vaginata* (Swartz) Bubani]: originally from tropical America and (verisimilarly) from tropical Asia, it has been reported on sea sands and rice fields of Portugal, Spain, Italy, France, and Germany.

Paspalum quadrifarium Lamarck [= *P. ferrugineum* Trinius], originally from southern America, adventitious in Italy.

Paspalum lentiferum Lamarck [= *P. curtisianum* Steudel, *P. glaberrimum* Nash, *P. tardum* Nash, *P. kearneyi* Nash, *P. amplum* Nash]: originally from the USA and recently reported as adventitious in Germany.

Concerning the particular species proposed by Hofmann, it should be pointed out that most taxonomists consider *P. distichum* L. a *nomen ambiguus* (a name that is not confidently

applicable to any known species), and prefer the binomial *P. paspalodes* (MICHAUX) LAMSON-SCRIBNER. Regarding the above-mentioned list, *P. paspalodes* is now the most widespread species of *Paspalum* in Europe, and the only one reported in Greece. It is very likely that the diffusion of this species, as with the other *Paspalum*, has been seen in recent times, and less likely in the past century, but surely this happened many years after the Conquest. Indeed, considering the dates of the first reports in the neighboring countries (for example, in Italy no one species of *Paspalum* has been observed before 1900; cf. FIORI 1923–1925, GARBARI 1972), the presence of *Paspalum* sp. in Greece cannot be dated before the past century. It is therefore possible to state with confidence that all the *Paspalum* species that originated from the New or the Old World, spread in recent times, due to voluntary or involuntary action of man—whether originally cultivated as fodder then becoming wild, or due to being imported and broadcast together with other cultivated seeds (for example fodders and cereals).

On the basis of these *data* the presence of *P. paspalodes* and any other species of *Paspalum* in ancient Greece has to be excluded. Furthermore, the insubstantiality of HOFMANN's second hypothesis regarding the preparation of the *kykeon* from ergot, is supported by the fact that *Claviceps paspali* is an ergot that exclusively infects graminaceous plants of the *Paspalum* genus (GRASSO 1955), and its presence in Europe is linked to the recent spreading of its host plants. It's enough to consider that the presence of *C. paspali* in France has been reported for the first time only in 1991 (RAYNAL 1996), and that Greek phytopathologists seem to exclude the presence of *C. paspali* today in Greece (AARAONSON 1989: 252). Again, in Italy *Paspalum dilatatum* was introduced in 1929 and appeared to be free from ergot until 1948 (TONOLO 1965).

Beside the botanical/corological considerations presented here, a symbolic/iconographic argument could be taken in consideration. The ergot hypothesis of the Eleusinian *kykeon* is also supported by the frequent representations of cereals in the iconography associated with the Eleusinian Mysteries. All the above-mentioned species of *Paspalum* have an appearance that is very different from that of the cereals cultivated for human consumption; *P. paspalodes* has an inflorescence constituted by two (rarely more than one) thin spikes at the top of the stem. It would seem strange that such a characteristic shape would have not found place among the Eleusinian images. Nor does there seem to be any hidden link between cultivated cereals and *Paspalum*, and the species of this last genus have a strongly different ecology (rice apart), and are not infestants of the cultivated fields spread during the Classic Greece period.

Nevertheless, we want to conclude by emphasizing that the reduction of the possibilities proposed by the Swiss chemist does not reduce the viability of the ergot hypothesis. HOFMANN himself stated concerning this: "I mention it only as a possibility or a likelihood, and not because we need *P. distichum* to answer Wasson's question" (HOFMANN 1978: 33). This topic will be examined further and in more detail in a article currently in publication (SAMORINI 1999). ✧

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