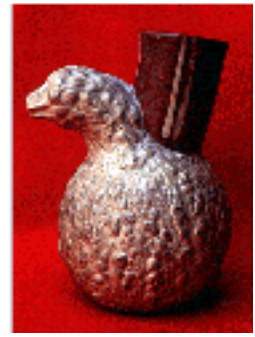




Ethnobotanical Leaflets



Nutsedge: Weedy Pest or Crop of the Future?

By Deatra J. Sams

Yellow nutsedge (*Cyperus esculentus* L.) is an invasive weed in the United States. It is often regarded as a useless pest to home gardeners as well as commercial growers. Along with being a useless weed it is difficult to control. Several commercial herbicides have been labeled for use exclusively on yellow nutsedge and are available at local retailers. This, of course, indicates much research has gone into the development of chemicals to eradicate it. In a country that spends much of its time and money on programs focusing on the advancement of crop production has the yellow nutsedge been labeled unfairly? Could the U.S. find use for *Cyperus esculentus* L.? A look into its past and present might reveal a profitable future.

Cyperus esculentus is in the order Commelinales and the family Cyperaceae. *Cyperus esculentus* can be distinguished from other species of New World nutsedge by its persistent linear brown spiklets that have closely appressed overlapping scales. This perennial plant is self-incompatible. The stem of yellow nutsedge is triangular and has a light green-yellow color. Rhizomes that terminate in tubers are the main means of reproduction, although it does produce viable seed.

It is interesting to note that the name Linnaeus chose for this sedge, *esculentus*, means edible in Latin (6). The two varieties of interest to us are *Cyperus esculentus* var. *esculentus* (weedy) and *Cyperus esculentus* var. *sativus* (cultivated). Most literature uses the name *Cyperus esculentus* for both the weedy and the useful sedge.

The weedy variety *esculentus* produces many seeds although the cultivated variety *sativus* produces few. Yellow nutsedge (weedy) has been reported to produce 605 million seeds per hectare in Massachusetts (4). Both reproduce vegetatively in great numbers. Research indicates that a single nutsedge tuber can produce about 1900 plants and 7000 tubers in one year (8). The weedy nutsedge was introduced to the Dutch Netherlands in the late 1970's concealed in *Gladiolus* and it was so invasive that in 1984 a restriction was implemented by the government. This regulation prohibits the harvest of any root crop in a field that is infested with the yellow nutsedge (3).

Cyperus esculentus var. *esculentus* and *Cyperus esculentus* var. *sativus* are closely related according to Moshe Negbi (6). The color of the tubers appears to be one unusual character. Variety *sativus* has a grey-orange color and variety *esculentus* has a grayed brown color according to the Royal Horticultural Society Colour Chart (3). The range between these colors is considerable.

The cultivated variety often referred to as 'chufa' does not have the over wintering capability of the perennial yellow nutsedge we are familiar with in our lawns and are grown as annual plants. They also lack the abundant seed production typical of the perennial nutsedge. Chufa tubers are also known to be larger than yellow nutsedges. These characteristics seem to indicate a possible pattern of human selection that may have separated the chufa from the weedy nutsedge. De Vries (3) reports that the taste of the weed compared to the cultivated has been found to be very similar, with the weedy sedge being more fibrous to chew it is less desirable.

Some common names used in addition to chufas when referring to *Cyperus esculentus* var. *sativus* are tiger nuts and earth-almonds. In Egypt and the Mediterranean nutsedges were used as sources of food, medicine and perfumes. The tubers were usually roasted before being eaten and routinely consumed by nursing mothers. Dried ground tubers were used in coffee and chocolate. Their oil was an ingredient in perfumed soap as well as a lubricant for fine machinery. The leafy plant parts were fed to livestock. Egyptians made very efficient use of the nutsedge. They used them in cultivation as early as 2400 b.c. by Egyptians (3). One such example of tiger nuts is depicted in a wall painting of an Egyptian tomb in 15th century b.c.. In the painting workers are shown to be weighing the nuts while a scribe records their work. In another part of the same tomb instructions were written for eating the tubers as sweets after grinding and adding honey. Tubers have been found in the tombs and are considered to be locally domesticated in Egypt (6). This gives the impression that the tubers were greatly valued by people as a food source. It appears *Cyperus esculentus* is one of the ancient food crops in Egypt in the company of emmers and barley. From this information it may be concluded that the cultivated variety was born out of the weedy variety.

Chemical analyses of yellow nutsedge tubers show they contain water, fiber, 9.9% oil, 44.9% carbohydrates and about 13.8% saccharose. Chufas contain considerably more oil and saccharose at 25.5% and 17.4% respectively (3).

Today food is the most prevalent use for these sedges. Chufas are reported to have an almond-like flavor and are considered a flavoring agent for nut roasting, ice cream and biscuits (1). Currently consumers in Spain await nutsedge season to enjoy a popular beverage made from the chufa. It is planted in early spring (March-May) and tubers are harvested four to five months later. Once harvested and washed they are ground, extracted using water, then sugar is added to sweeten the milk-like beverage. This beverage is called 'Horchata De Chufas' or tiger nut milk. In Central and South America another version of hochatas is made with rice and vanilla (5).

Chufa is also produced in the southern part of the United States (Florida) as fodder for livestock (5). Nutsedge is also popular with hogs, deer and turkey. Nutsedge is of major importance as food for

waterfowl as well (5).

Some research has been done on the oil extracted from the seeds of yellow nutsedge (*Cyperus esculentus* var. *esculentus*) as a non-conventional oilseed. This study was used to determine oil substitutes for more conventionally used oil types such as soybean, palm and olive oils. Non-conventional oils would be less expensive and therefore more available to poorer (developing) countries. Yellow nutsedge has an overall oil content of 22.5%. The main type of fatty acid is oleic at 64.2% which shows a good potential as a substitute for imported olive oil. Nutseed oil was also measured for viscosity. The results indicate that nutsedge seed oil has a very low viscosity making it a suitable substitute for industrial applications in petroleum and natural gas.

With attributes like these there should be a company out there in the U.S. willing to exploit the yellow nutsedge.

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