

Phytomedicines as a New Crop Opportunity

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Phytomedicines, simply defined, are a special category of plant drugs. They are standardized, which means that certain compounds in the plant material are quantified and elucidated so as to have a replicable final product, batch after batch. One of the criticisms traditionally leveled against natural medicines is the lack of standard levels of biological materials from the natural plants.

In many parts of the world, the United States is considered a third world country when it comes to phytomedicines. Unfortunately, our European colleagues are far ahead of us; they have a multi-billion dollar industry in phytomedicines, whereas ours is only a two hundred million dollar industry. Even so, there are a lot of exciting developments in the United States. Over the last five years, I estimate that the American medicinal herb industry has grown at a rate exceeding 20% per year and this trend continues today.

Phytomedicines represent new crop opportunities for several reasons. First, the companies who use these products are very keen to get high quality, sanitary material. This is becoming quite a serious problem. One example we have seen quite recently relates to problems in Eastern Europe, the source of many of these plants. Would you buy plant material which has been growing next to a steel plant in Eastern Europe? Most people would not. The United States is a good growers market because it has a stable political environment, has many different growing climates and conditions, excellent choice of growers, and the ability to grow according to industrial specifications. The Appalachian region, in particular, is very rich in medicinal flora.

Of growing concern is the extinction of medicinal plant species in this country. Given the growing demand for these botanicals and current problems in over-collecting, it is quite likely that some of the last populations of these plants will be collected over the next five to ten years if we don't begin to cultivate them commercially. Finally, these specialty crops could provide profitable growing opportunities for small farmers. Some of these crops appear to be ideally suited to the small farmer.

IMPORTANT MEDICINAL PLANTS

Ginkgo biloba. The nuts of this tree are quite tasty when properly roasted. An extract (Fünfgeld 1988) derived from the leaf of this tree is the single largest selling drug in Germany and France today (Foster 1991). The extract is used for peripheral circulation and has the unique property of making red blood cells more elastic and selectively dilating capillaries. Consequently, this extract is used in Europe for treating conditions of tinnitus, vertigo, cold hands, cold feet, macular degeneration, and dementia. In order to meet the demand for the leaf, there is a 400 hectare farm in South Carolina which produces over a million kilograms of dried leaves a year. There are other plantations now being developed to meet the international demand for this product.

American ginseng (*Panax quinquefolium*). In Marathon County, Wisconsin, alone, this crop represents a one hundred million dollar a year crop (raw and finished product) which is primarily exported to China where it is widely used and appreciated. Oddly enough, we buy *Panax ginseng* from China because Americans prefer their material and they ours.

Saw palmetto (*Serenoa repens*). The berries of the Saw Palmetto are quite useful for benign prostatic hypertrophy. This is a very big pharmaceutical in Germany and France. There is a well developed industry in Florida which produces berries for export to Europe.

Goldenseal (*Hydrastis canadensis*). This is one of the fastest growing products in the United States in the natural products industry and used to be in the United States Pharmacopoeia until about 40 years ago. It is native to Appalachia and is one of the crops that is most threatened by extirpation because of growing demand. Ginseng growers in Wisconsin have been contacted to see if they could grow Goldenseal. To date, the project is showing signs of success, and it seems likely that a large percentage of this product will come from cultivated plots rather than naturally occurring populations.

Bloodroot (*Sanguanaria canadensis*). This is very popular and is the active ingredient in a toothpaste product called Viadent. It is used to control plaque and gingivitis (Bennet et al. 1990).

Siberian ginseng (*Eleutherococcus senticosus*). This is a very popular and interesting product. It is called an adaptogen. It was developed in Russia by Dr. Breckman. Adaptogens are body regulators which promote proper balance. Many medical doctors question this hypothesis, but there is a significant amount of empirical and clinical data from Russia to support this (Farnsworth et al. 1985).

Echinacea (Echinacea purpurea). This is a popular nonspecific immunostimulant in Germany and much of Europe. There are hundreds of hectares of cultivated *Echinacea* in Europe. There is also a large organic farm, Trout Lake Farm in Washington State, which grows significant amounts of this product. *Echinacea* is used as a preventative for colds and flues and is quite effective when used in this way. It is one of Europe's most popular natural products.

Milk thistle (*Silybum marianum*). This is used in Europe for liver conditions, treatment of acute mushroom poisoning, and other hepatotoxic compounds.

Black cohosh (*Cimicifuga racemosa*). This is an interesting native American plant. It has a rich tradition among Native Americans and by people who live in the Appalachian region. It is used by women for regulation of hormonal cycles (Foster and Duke 1990).

Valerian (*Valeriana officinalis*). This is one of the more popular sleep aids in Europe and has been widely used for hundreds of years. There is no reason why this cannot be grown in the United States.

Feverfew (*Tanacetum parthenium*). Research in England has shown promising results in the treatment of migraine. A small amount of feverfew when taken orally can reduce the frequency and severity of migraine. It has great medical potential and could most definitely be grown in this country (Awang 1989).

St. John's wort (*Hypericum perforatum*). This is a popular European product. It has antiviral properties and also antidepressant properties (Hobbs 1988/1989).

Catnip (*Nepeta cataria*). Not only is it my cat's favorite play thing, but it is also used as a mild sedative (Tyler 1987). This is currently being grown in the United States as a sedative, although not commercially.

Pacific yew (*Taxus brevifolia*). At the moment, this is a most controversial and interesting phytomedicine. The Pacific yew tree is the source of taxol which shows great promise for the treatment of ovarian and other cancers. However, there are not enough trees. These trees grow very slowly, and if harvested for taxol, the natural stands of the yew tree would be exhausted. The ability to obtain taxol from ornamental sources of *Taxus* as well as planting nurseries of the western yew for taxol extraction are underway.

Ginger (*Zingiber officinale*). It is not only a well known spice, but it has been proven to be as effective as dramamine in reducing nausea and motion sickness (Holtman et al. 1989). It has also been quite useful for pregnant women who are suffering nausea in early pregnancy and is quite safe (Bone et al. 1990).

CONCLUSIONS

In the United States, the policies of the Food and Drug Administration (FDA), historically, have been unhelpful to natural products. These plant products are polypharmaceuticals, meaning they have multiple compounds, and FDA is not presently prepared to review products containing more than one compound. Demanding evidence that each individual component in an extract is safe and effective is a matter of scientific curiosity, but has little to do with the inherent questions of safety and effectiveness of the extract. Unfortunately, FDA still struggles with this concept.

The natural healthcare market is a very fast growing one. It is projected that at current inflation rates for health care, by the year 2030, health care costs could consume 100% of the gross national product. Something must be done. People are turning more and more to prevention and wellness programs, including natural medicines. As this trend develops, phytomedicines could become an important new alternative crop in the United States.

REFERENCES

- Awang, D. 1989. Feverfew. *Can. Pharm. J.* 122(5):266-70.
- Bennett, B.C., C.R. Bell, and R.T. Boulware. 1990. Geographic and variation in alkaloid content of *Sanguinaria canadensis* (Papaveraceae). *Rhodora* 92(870):57-69.
- Bone, M.E., D.J. Wilkinson, J.R. Young, J. McNeil, and S. Sharlton. 1990. Ginger-root--a new antiemetic. The effect of ginger root on postoperative nausea and vomiting after major gynaecological surgery. *Anesthesia* 45(8):669-671.
- Farnsworth, N.R., A.D. Kinghom, D.D. Soejarto, and D.P. Waller. 1985. Siberian ginseng (*Eleutherococcus senticosus*): Current status as an adaptogen, p. 155-215. In: H. Wagner, H. Hikino, and N.R. Farnsworth (eds.). *Economic and medicinal plant research*. Vol. 1. Academic Press, Orlando, FL.
- Foster, S. 1991. *Ginkgo (Ginkgo biloba)*. American Botanical Council. Botanical Series #304. Austin, TX.
- Foster, S. and J. Duke. 1990. *A field guide to medicinal plants: Eastern and Central North America*. Houghton Mifflin Co, Boston.
- Fünfgeld, E.W. (ed). 1988. *Rökan (Ginkgo biloba)*, recent results in pharmacology, and clinic. Springer-Verlag, Berlin.
- Hobbs, C. 1988/1989. St. John's Wort *Hypericum perforatum*. *L.A. Review. HerbalGram* 18/19:24-33.
- Holtman, S., A.H. Clarke, H. Schreer, and M. Hohn. 1989. The anti-motion sickness mechanism of ginger. *Acta Otolaryngol (Stockh)*. 108:168-174.
- Tyler, V.E. 1987. *The new honest herbal*. George F. Stickley Company, Philadelphia.