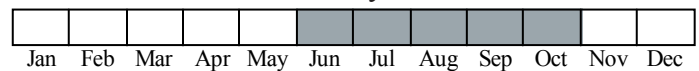


Best Survey Period



Status: state threatened, federal species of concern

Global and state rank: G4/S2S3

Other common names: “seng”

Family: Araliaceae

Taxonomy: There are eight species of ginseng in the world, seven in the genus *Panax* and one in the genus *Eleutherococcus*, the latter an Asian group of shrubs. Only three species, however, are widely used in herbal medicine, for which ginseng is widely known. These include American ginseng (*Panax quinquefolius*), native to North America, Oriental ginseng (*P. ginseng*) native to Manchuria and Korea, and Siberian ginseng (*Eleutherococcus* [*Acanthopanax*] *senticosus*), native to Siberia (Castleman 1990). Populations of the latter two species, once abundant throughout Siberia, Korea, and Central China, have seriously declined due to intensive collection over centuries. This decline, in part initiated the advent of the trade in North American ginseng.

Total range: *Panax quinquefolius* ranges from the province of Quebec west to Minnesota and south to Georgia and Oklahoma. It has declined considerably throughout much of its range due to exploitation of the root for export to the Far East. Although it is listed as threatened in the State of Michigan, there has been sufficient concern over its status in the United States such that the U.S. Endangered Species Scientific Authority banned its export during the 1977-78 season from all states except Michigan. Michigan was exempted because of its permit system governing the collection of ginseng

(Laycock 1978). Currently, American ginseng export is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) agreement. It can only be exported if it is shown to be legally obtained and determined not detrimental to the survival of the species. States are given control over the management and certification for export of ginseng within their boundaries and are required to develop and implement a ginseng management program. They are required to submit specific export findings on a three year schedule.

State distribution: Michigan occurrences of ginseng are concentrated in the southern three tiers of counties in the Lower Peninsula, primarily in woodlots and wooded coastal dunes, where populations typically are small, sometimes consisting of only a few individuals. The small population size is likely due to extensive woodlot grazing and to the considerable exploitation of this species for the ginseng trade over the years. There are scattered occurrences of ginseng in the northern Lower Peninsula counties, including the northwestern region where it is quite rare, and the thumb region where it is infrequent. Documented occurrences in the thumb region often include a wider age-range of plants than in the south, usually including the presence of some large, old individuals. In the Upper Peninsula, ginseng has been found only in Gogebic County.

Recognition: *Panax quinquefolius* grows from a **fleshy and often forked taproot** for which it is widely known. At maturity it has a **single whorl** (growing from the same point along the stem) **of 3-5 palmately compound leaves**



each with 3-5 stalked and toothed leaflets. The leaflets are widest just before they reach the abruptly pointed tip; typically there are 3 large and 2 small leaflets. **A central cluster (umbel) of small greenish-white flowers** rises above the leaves and produces **bright crimson, berry-like fruits** at maturity, each bearing from 1-3 seeds. Ginseng is perhaps most frequently confused with Virginia creeper (*Parthenocissus* spp.), one of its most frequent associates, due to its similar palmately compound leaves with five leaflets. As can be seen in the upper right-hand corner of the photo, the leaflets of Virginia creeper are more coarsely toothed than those of ginseng and are of equal size. Ginseng is also easily confused with such look-alike plants as black snakeroot species (*Sanicula* spp.) and honewort (*Cryptotaenia canadensis*), especially when plants are in juvenile stages characterized by a single leaf with three leaflets. Ginseng can be distinguished from these look-alikes by the small unbranched hairs along the major veins of its leaves; these are usually lacking in the other species. Another look-alike plant is wild sarsaparilla (*Aralia nudicaulis*) which is of superficially similar size and form. The leaves of wild sarsaparilla, however, are alternate (arising from different points along the stem) instead of whorled and the leaflets are arranged in either side of a central axis (pinnately compound) instead of radiating from a central point. Finally, ginseng is also easily confused with young hickory seedlings which have similar palmately-compound leaves and can at first glance appear herbaceous.

Best survey time/phenology: Although *Panax quinquefolius* can, upon close inspection, be recognized during the entire growing season, it is much more difficult to find amongst its associates when not in flower or fruit. It is most reliably sought during the flowering and fruiting stages which typically occur from June to October. This species, however, is notably difficult to find even during these stages according to the numerous accounts of collectors.

Habitat: This species is predominantly found in rich hardwoods, often on slopes or ravines, ranging even into swampy portions. It also occurs in wooded dune hollows and leeward slopes along the Lake Michigan shoreline. According to Duane Honsowetz, a long time ginseng hunter in Michigan, Floyd Swink provides the best description of its habitat in *Plants of the Chicago Region* (1974): "in rich woods, with greater occurrence on north-facing slopes. Associates include sugar maple (*Acer saccharum*), white baneberry (*Actaea pachypoda*), maidenhair fern (*Adiantum pedatum*), rattlesnake fern (*Botrychium virginianum*) (known in the south for its ability to indicate "seng" habitat), bitternut hickory (*Carya cordiformis*), blue cohosh (*Caulophyllum thalictroides*), toothwort (*Dentaria* spp.), Dutchman's breeches (*Dicentra cucullaria*), running strawberry bush (*Euonymus obovata*), sharp-lobed hepatica (*Hepatica acutiloba*), red oak (*Quercus rubra*), bloodroot (*Sanguinaria canadensis*), false Solomon's seal (*Smilacina* spp.), basswood (*Tilia*

americana), and bellwort (*Uvularia grandiflora*)."

Honsowetz adds red maple (*Acer rubrum*) and white ash (*Fraxinus americana*) to the list of associates. He further states that ginseng grows best in heavy soils (clay mixed with gravel) covered with leaf mold or rotted wood. It also grows in clay, sandy-loam or sometimes silt; however, the roots of plants growing in these soils may be considered lower in quality by ginseng collectors.

Biology: Ginseng is a long-lived perennial herb, germinating from seed in early spring 18-22 months after the seeds drop to the ground. The embryo is inactive during the first winter, matures during the next growing season, and then endures a second winter before it is able to germinate (Hu *et al.* 1980). A special underground stem known as a verticle rhizome sits on top of the main root and sends up the above-ground stem each year. During the first year, it grows to approximately 2-5 inches and produces one leaf (commonly termed a "prong") composed of 2-3 leaflets. Additional leaves and leaflets are produced during successive years as the plant ages, depending upon environmental conditions. Typical mature plants develop three leaves, each with five leaflets. Older plants may produce four or even five leaves. Flowering may occur during the fourth year; however, often it is not until the fifth year or later that mature fruit is produced. Flowering occurs during June and July, with the flowers developing small green fruits in late July and early August. In late August and September the fruits ripen, becoming bright crimson in color, with each berry-like fruit containing one to two or rarely three seeds.

When the above-ground stem dies with the onset of frost, a scar remains on the rhizome where the stem was attached. Each successive above-ground stem leaves a scar above the last year's scar and by counting these scars the approximate age of the plant can be determined. The mass of the root increases with each successive year such that the size of the above-ground plant serves to predict the size of the root (Anderson *et al.* no date).

Known pollinators of ginseng include halicted sweat bees (*Dialictus* spp.) and syrphid hover-flies (*Toxomerus geminatus*) (Duke 1980). Ginseng has also been shown to be capable of self-pollination. Data as to the relative proportion of each breeding system for sample populations have been mixed. It is likely correlated to local environmental conditions and availability of pollinators. Seed survival has been shown to be low and the number of offspring produced (fecundity) has been shown to be correlated with age and size, and regulated by the availability of resources (Lewis *et al.* 1982; Schlessman 1985).

Conservation/management: The primary cause of decline for this species is that of exploitation by collectors in response to consumer demand, particularly in the Orient where ginseng is esteemed and highly prized as an herbal elixir or tonic with numerous uses. Its use as a medicinal herb in the Far East dates back thousands of years. The



occasional resemblance of the roots to the human form led to the belief that ginseng had curative properties for the entire body. Ginseng root is consumed in teas, powders, pills, soft drinks, and many other products, comprising a highly valued trade product. As the Far Eastern species began seriously declining, the American ginseng trade became lucrative. The demand for wild ginseng remains high, and not unexpectedly, American populations have shown significant declines as well. Although cultivation of ginseng does occur, the demand for the cultivated root remains well below that which is of wild origin, and thus is not likely to significantly deter the harvesting of natural populations. In Michigan, owing to a lack of knowledge of the current status of this species' recorded occurrences, it is unlikely that harvesting will be legally permitted until the statewide status is reliably assessed.

In addition to widespread exploitation, ginseng has also declined due to significant habitat loss and modification. This has resulted from extensive timber cutting and disturbance through habitat fragmentation, especially in southern Michigan. Although little specific research and monitoring has been conducted to establish that ginseng populations suffer in response to disturbance, the majority of documented populations in Michigan are found in relatively undisturbed habitat and appear vulnerable to overstory removal. According to one Michigan collector (Honsowetz), ginseng has never been found in grazed woodlots. The conservation of relatively large, ecologically viable tracts of rich woodland habitat is critical to the maintenance of this species in Michigan.

Comments: The Michigan Ginseng Act, Public Act 184 of 1994, was passed at the encouragement of the Michigan Department of Agriculture to assist in the certification and legal export of cultivated ginseng.

Research needs: Perhaps the primary research need at the present is a comprehensive state inventory to determine the status and extent of the state's ginseng population, such that harvesting of wild stock may be considered or continue to be prohibited.

Related abstracts: mesic northern forest, assiniboia sedge, fairy bells, goblin fern, green spleenwort, Hart's-tongue fern, large toothwort, showy orchis, walking fern, red-shouldered hawk

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