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MUGWORT

(*Artemisia vulgaris*)



In the latter half of the nineteenth century, mugwort spread rapidly from sites of introduction at ports, especially in the Philadelphia-Camden area. These sites were dumps where ships discarded ballast.

Figure 19.1 Mugwort (*Artemisia vulgaris*) surrounded by tufts of green foxtail (*Setaria viridis*) in the median strip at Broad and Bainbridge Streets, facing City Hall.

By the time the first compendium on the flora of Philadelphia was published in 1818, most of the species of weeds common today in Center City were well established. One notable exception is mugwort (*Artemisia vulgaris*), an introduced species the compendium omits.¹ The oldest specimen of this species in the United States was collected by Thomas Nuttall on a botanical trip from Philadelphia to Delaware in 1809, and the next oldest was collected in Camden, New Jersey, in 1837;² but the plant had naturalized in New England³ and Canada long before. Merritt Lyndon Fernald concluded that Jesuit missionaries introduced mugwort into southeastern Canada in the sixteenth century.⁴

Medicinal herb

The species was cultivated as a medicinal herb and used as a panacea, as described in William Salmon's *Botanologia*, published in London in 1710:

It prevails powerfully against the Poyson and Malignity of Poppies and Opium: rectifies the Stomach, stops Vomiting, and causes a good digestion. It allays Vapors, opens all sorts of Obstructions of the Bowels, and cures the Rickets in Children: It likewise cleanses the Reins and Bladder of Tartarous Mucilage. Dose from twenty to sixty Drops or more, according to the quantity of the Vehicle it is taken in: it may be given in Canary, or other Generous sort of Wine, two, three, or four times a day.⁵

Botanicum Officinale, published in London in 1722, reported additional uses:

The Leaves of Mugwort, are chiefly used, and principally against, Distempers incident to the Female Sex, being of great Service in promoting the menstrual evacuations, both given inwardly and used outwardly in Baths and Semicupia; they strengthen the Head and Nerves, and are very good against hysteric Fits or Vapours.⁶

Evolution in North America

Jacob Barney at Cornell University systematically recorded the date and location of dried specimens of mugwort in historic collections in herbaria. He used the data to track the species' dispersal in North America. He found that the range of the plant had been stable in the United States until around 1860, when it started to expand rapidly outside of its established centers of distribution in New England and Canada.⁷

He and his colleagues cultivated mugwort from populations native to Europe and compared its growth with that of mugwort from populations naturalized in North America. Compared to European mugwort, American mugwort was shorter and germinated earlier; it produced more vegetative clones (ramets), more biomass, and higher ratios of roots to shoots. When cultivated with goldenrod (*Solidago canadensis*), a native species with which it competes, it suppressed goldenrod more effectively than did European mugwort. Barney and colleagues concluded that after its introduction into North America, mugwort evolved adaptations that promoted its rapid spread.⁸

Ships' ballast

How did mugwort adapt? The center of distribution of the genus *Artemisia* is located in the cold arid steppes of central Asia.⁹ In their *Flora of North America* published in 1841, John Torrey and Asa Gray noted “a dozen varieties of this polymorphous and widely diffused species,” which then included four named varieties in North America.¹⁰ Barney found that rapid expansion of mugwort in North America began geographically with mugwort first colonizing sites created by the dumping of rocks and earth in ships' ballast, as recorded on labels of historic specimens of mugwort in herbariums. He concluded that importation of mugwort in ships' ballast was the primary source for this species' explosive geographic dissemination starting in the latter half of the nineteenth century. He mapped ballast sites where the plant was collected on the East, West, and Gulf Coasts, and found that ballast in Philadelphia and Camden counties together accounted for eleven possible introductions—more introductions than all the others combined.¹¹

The concentration of herbarium specimens of mugwort from dumps of ballast in Camden and Philadelphia could be an artifact of the dedication of Philadelphia's botanists,¹² but such a bias would not change the observation that colonization of ballast heralded local geographic spread of mugwort. Repeated introduction of mugwort through the ports of Philadelphia and Camden brought together foreign strains that had previously been geographically isolated. In ballast dumps near the city's docks, the same breezes that brought sailing ships into port would have helped cross-pollinate these geographically disparate strains of mugwort, which is wind pollinated.¹³ Hybridization likely contributed to mugwort's dramatic spread in the latter half of the nineteenth century.



Figure 19.2 Port along the Delaware River, south Philadelphia, 1870. Just south of here ships dumped ballast of rocks and soil, introducing exotic plants from around the world. They also dumped ballast in Camden, directly across the river. (Photo from Free Library of Philadelphia. Courtesy of Free Library and PhillyHistory.org, a project of the Philadelphia Department of Records.)



Figure 19.3 Mugwort (*Artemisia vulgaris*) collected June 13, 1897, from ballast ground, Kaighns Point, Camden, New Jersey, directly across the river from south Philadelphia. (From the herbarium of the Academy of Natural Sciences of Philadelphia, now the Academy of Natural Sciences of Drexel University. Courtesy of the Academy)

Dissemination

Historical collections of mugwort in herbariums show that, after mugwort appeared in ballast dumps in ports, it appeared along highways and railroads, indicating that rails and roads dispersed mugwort after its initial introduction. Air turbulence from passing traffic and trains presumably carried the seeds, which are only 1–2 millimeters in diameter. At the same time, horticultural trade spread mugwort as ornamental and herbal plantings; nurseries also dispersed it accidentally.¹⁴ In Philadelphia, ships, trains, motor vehicles, and nurseries acted together in mugwort's importation and dissemination.



Figure 19.4 Population of mugwort growing as a dense, continuous monoculture along railroad tracks. The view is looking north from Walnut Street Bridge in Center City.

The first publication documenting the presence of this species in our region was William Darlington's *Flora Cestricea*, a 640-page treatise published in 1837. About mugwort he wrote:

The *A. vulgaris*, or common Mugwort,—with pinnatifid leaves, green above, and whitish, tomentose beneath—is occasionally to be found about old gardens; but can hardly, in strictness, be considered either as naturalized, or cultivated for any useful purpose. It is certainly not a native, here.¹⁵

In 1945, Hugh E. Stone produced a monumental sequel to Darlington's flora. It was published in two volumes, totaling 1450 pages. Stone found no evidence of mugwort in Chester County since Darlington's report.¹⁶ The failure of mugwort to establish itself in the first half of the nineteenth century in Chester County makes sense: the plant's evolutionary transformation in North America took place in the second half of the nineteenth century.

Mugwort has been ranked among the ten worst weeds of nurseries in the eastern United States.¹⁷ Ann Fowler Rhoads and William M. Klein, presenting results from the Pennsylvania Flora Database of herbarium specimens, reported that the plant inhabits all counties in southeastern Pennsylvania, including Chester County.¹⁸ Its North American distribution, once concentrated in Canada,¹⁹ now encompasses almost all of the eastern United States, including Florida. In Washington, DC, its pollen has become a common aeroallergen.²⁰ It inhabits all continents except Africa and Antarctica.²¹



Figure 19.5 Mugwort leaves, broad and toothed.

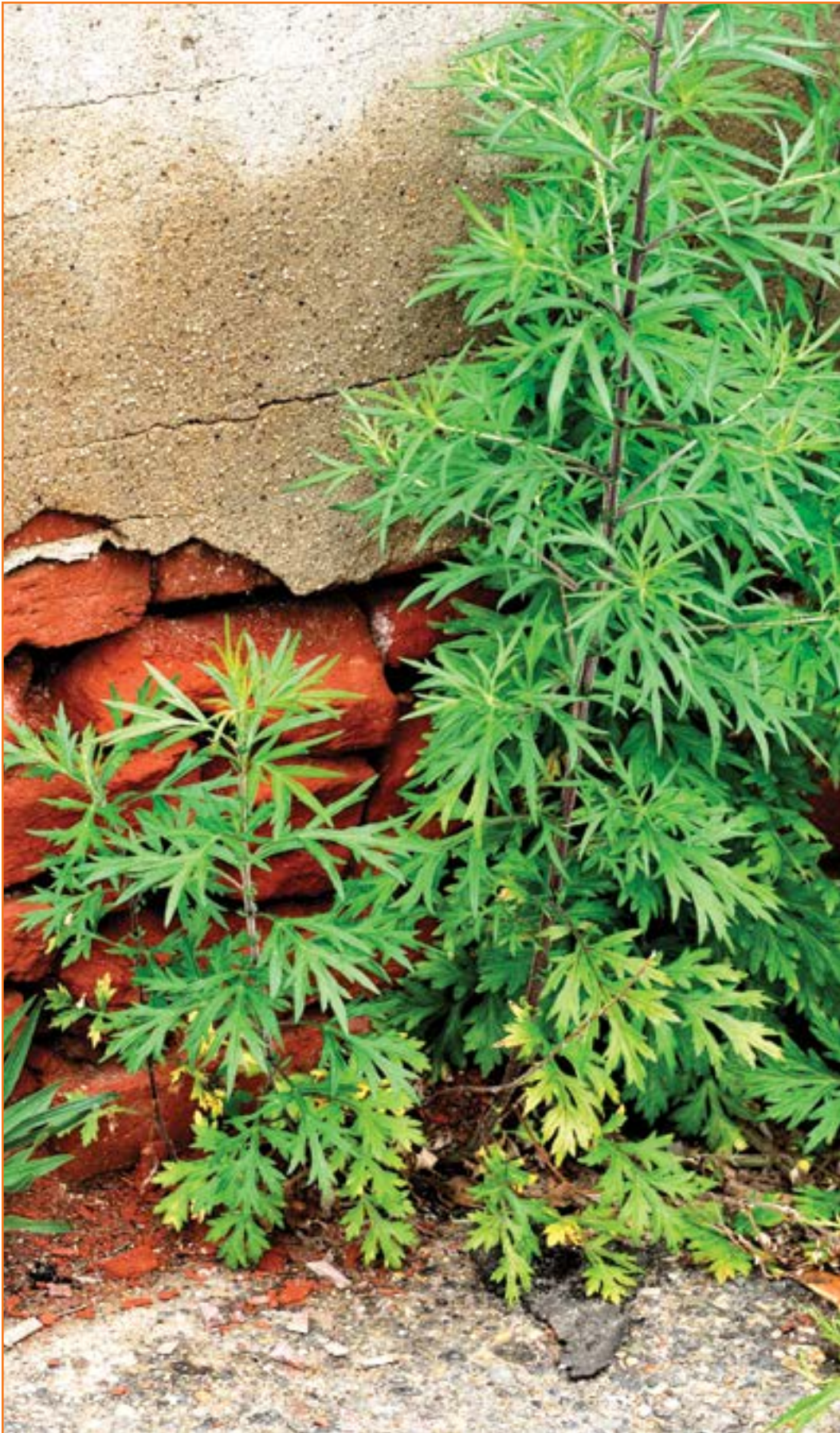


Figure 19.6 Mugwort leaves, deeply cut.



Figure 19.7 Mugwort leaves, inconspicuous on upper stems.



Figure 19.8 Mugwort flowers in September.

Future of mugwort in Philadelphia

Today in Center City, mugwort grows in cracks in pavement and masonry, along curbs, and in gardens and any kind of soil. It thrives especially along railroad tracks, despite frequent application of herbicide, which suppresses it temporarily. Mugwort is resistant to many herbicides.²²

Although widely distributed downtown, mugwort is easy to overlook. In August, its height ranges from 2 meters to 0.1 meter, depending on location. By the time the plant has grown to eye level, its diagnostic leaves are hidden in its base or withered. The leaves vary in size and shape on different plants and on the same plant, and they may resemble those of other species, including chrysanthemum, common ragweed (*Ambrosia artemisiifolia*), and white heath aster (*Symphotrichum ericoides*). The white, wooly texture that Darlington pointed out on the undersurface of its leaves helps distinguish mugwort from species with leaves of similar shape.

Philadelphia catalyzed the evolution of mugwort into a successful urban colonizer. Its ballast dumps brought together genotypes of mugwort from around the world. Its industrial transformation subjected mugwort to novel selective pressures. Its highways, rails, and ports endowed mugwort with diverse routes of dissemination. In Center City today, the morphological variability of mugwort continues to present targets for natural selection.