

NOMENCLATURE OF THE THICKET CREEPER, *PARTHENOCISSUS INSERTA* (VITACEAE)

James S. Pringle

Royal Botanical Gardens
P.O. Box 399
Hamilton, Ontario, Canada L8N 3H8

ABSTRACT

Parthenocissus inserta (A. Kern.) Fritsch, rather than *P. vitacea* (Knerr) Hitchc., is the correct name for the thicket creeper, a species related to the Virginia creeper, *P. quinquefolia*.

KEY WORDS: *Parthenocissus*, Vitaceae

Two species of *Parthenocissus* are native to eastern and central North America. One of these, to which the common name Virginia creeper is more appropriately applied, is *P. quinquefolia* (L.) Planch. Its natural range extends from Mexico probably to southern Maine, southern Ontario, and southern Minnesota, although it has escaped from cultivation farther north. The other species, the nomenclature of which is discussed here, has a more northern and western range, from Pennsylvania, Texas, and California north to ca. 50°N in Ontario and Manitoba. “False Virginia creeper,” “thicket creeper,” and “grape-woodbine” have been proposed as vernacular names for the northern species, but none of these names has become widely used. Because of their abundance and the size of the plants, these species are ecologically important, influencing succession and providing cover and food for wildlife. They are widely cultivated as ornamental vines in North America and Europe, although they may sometimes become a problem, as when shrubs or specimen trees are engulfed.

Until early in the twentieth century few botanists distinguished between these species, and the assumption that “the” Virginia creeper is *Parthenocissus quinquefolia* continues to result in reports of *P. quinquefolia* from localities north of its true range. The two species are most readily distinguished by the size and branching pattern of the inflorescence. An inflorescence of *P. quinquefolia* commonly contains 25 to 200 or more flowers. The primary axis, although it zigzags, is continuous through the inflorescence, with dichotomous branching being limited to the lateral cymules. In the northern species, the inflorescence usually contains 10 to 60 flowers and is dichotomous throughout, with no central axis. These species also differ in the form of the expansions at the tips of the tendril branches, by means of which the vines cling to the surfaces or supports on which they climb. This topic, which is relevant to the nomenclature of these species, is discussed below. Additional differences exist in the shape and glossiness of the leaflets, the size of the fruits, and the number of seeds per fruit.

The nomenclatural history of the southern species, *Parthenocissus quinquefolia*, to 1967 has been reviewed by Webb (1967). Reveal’s (in Jarvis 2007) subsequent designation of an unambiguous specimen of that species as the lectotype

of the basionym *Hedera quinquefolia* L. has eliminated uncertainty as to its correct name. The northern species was called *P. inserta* (A. Kern.) Fritsch in Gray's *Manual of Botany*, ed. 8 (Fernald 1950), and *P. vitacea* (Knerr) Hitchc. in the *New Britton and Brown Illustrated Flora* (Gleason 1952). It has been called *P. inserta* in some more recent references, e.g., Staff of the Liberty Hyde Bailey Hortorium (1976), Voss (1985), Huxley et al. (1992), Swink and Wilhelm (1994), Cooperrider (1995), Newmaster et al. (1998), and Rhoads and Block (2007), and *P. vitacea* in others, including Gleason and Cronquist (1991), Moore (1993), Kartesz (1999), Wetter et al. (2001), Newmaster and Subramanyam (2005), Magee and Ahles (2007), and Dirr (2009). Recent use of the latter name has sometimes been accompanied by a citation of its acceptance in another flora or by an unsupported statement that the name *P. inserta* was misapplied to the northern species, but seldom by the citation of any nomenclatural study. The exceptions cite a paper by Gleason (1947), which is discussed below.

The southern and northern taxa, as varieties of *Ampelopsis hederacea* DC., were first distinguished taxonomically by Focke (1875), who had observed these taxa in cultivation in Germany. He designated the northern taxon *A. hederacea* var. *dumetorum*. The first to divide *Parthenocissus quinquefolia* s. lat. into two species equivalent to those currently accepted was Kerner von Marilaun in 1887. Kerner, who included these species in *Vitis* L., and who did not refer to Focke's paper, divided the broadly circumscribed species into *V. quinquefolia* (L.) Lam. s. str. and *V. inserta* A. Kern. Probably because the latter name was published in an ecological rather than a taxonomic work, by an author whose newly described species were mostly European, this taxonomic innovation did not immediately become well known among North American botanists. In Ohio, Lazenby (in Lazenby and Werner 1890) independently distinguished the two taxa morphologically in 1890, calling the northern taxon "a well-defined variety," but he did not distinguish it by name. Knerr, in 1893, without reference to any of these earlier publications, divided *P. quinquefolia* s. lat. [as *Ampelopsis quinquefolia* (L.) Michx.] into the nominate variety and var. *vitacea* Knerr, applying the latter name to the northern taxon. The following year Hitchcock (1894) raised Knerr's variety to species status as *Parthenocissus vitacea* (Knerr) Hitchc.

Wider recognition of the two species was fostered by the publication of several works by Rehder. In Sargent's *Trees and Shrubs* (Rehder 1905a) he provided a detailed description and illustration of the northern species as *Parthenocissus dumetorum* (Focke) Rehd., that name being a new combination based on *Ampelopsis hederacea* var. *dumetorum* Focke. Competing codes of nomenclature still existed at that time, and Rehder was probably following an old rule whereby the priority of an epithet was not limited by taxonomic rank. As he included the older specific name *P. vitacea* in synonymy, the name *P. dumetorum* is illegitimate under current rules, which provide that an epithet has priority only within the rank or ranks in which it has been published. In two slightly later papers (Rehder 1905b, 1908) on the systematics of the North American species of *Parthenocissus* (in 1908 as *Psedera* Necker), Rehder applied the specific epithet *vitacea* to the northern species, with no mention of the epithet *inserta*.

Fritsch called attention to the older epithet *inserta* in 1922, and published the new combination *Parthenocissus inserta*. In 1939, by which time he was again using the generic name *Parthenocissus*, Rehder, citing Fritsch, noted the exis-

tence of the earlier specific epithet and began using the name *P. inserta* (A. Kern.) Fritsch. In some manuals the name *P. vitacea* has been accepted with *P. inserta* given as a synonym, but that treatment is incorrect; if the two names are regarded as heterotypic synonyms, the epithet *inserta* has priority at the rank of species. The nomenclatural uncertainty is due to a question as to the species to which the earlier epithet, *inserta*, was originally applied.

As described (as *Vitis*) by Kerner (1887, seen in translation by Oliver), the tendrils of *Parthenocissus quinquefolia* s. str. form discs upon contact with a wall or other surface. These discs, which Kerner likened to the toes of a tree frog, expand and secrete a sticky substance. They become cemented to the surface on which they climb, and adhere firmly even to smooth surfaces such as glass or polished iron, although this species is most often seen climbing on trees. In the other species, which Kerner called *Vitis inserta*, expansion of the tendril tip does not take the form of a disc, but occurs only after it has become inserted into a narrow crevice, as in bark. Upon expansion, a callus develops and the tendril tip becomes tightly wedged in the crevice (the principle of Chair-lok, for a modern simile). Its external cells closely conform to the irregularities of the surfaces of the crevice—in Kerner's words, translated, looking "as if melted wax had been poured into the crevice and then solidified." Kerner believed that light or its absence was a factor in expansion of the tendril tips, because *V. quinquefolia* formed discs merely upon contact with a surface, whereas in *V. inserta* tendril-tip expansion occurred only in the dark interior of a crevice.

Kerner used the name *Vitis inserta* in a discussion of tendrils as though it had already been published. He may have intended to name the new species in a paper that was never published, or to include it in exsiccatae that were never distributed. Despite this departure from the usual format for naming a new taxon, Kerner clearly used the binomial *Vitis inserta* as the name of a species, and his description and illustration of the tendrils were diagnostic in distinguishing that species from *V. quinquefolia*, thus meeting the retroactive requirements for valid publication of a botanical name in 1887, as recognized by Gleason (1947) and Webb (1967). Kerner did no field work in North America, but his detailed description of the tendrils of *V. inserta* indicates that he had observed the growth of plants over time. His illustration indicates that he had seen tendrils with their tips in crevices in bark, which would not usually be present with herbarium specimens. It seems likely, therefore, that he had studied live plants, probably in the botanical garden in Vienna. He cited no specimens with this description of tendrils, probably not considering the *Pflanzenleben* an appropriate context. The "Virtual Herbaria" Web site of the Institute of Botany, University of Vienna (2006), indicates that neither the herbarium of the Natural History Museum Vienna (W) nor that of the University of Vienna (WU), where specimens collected or studied by Kerner would be expected, contains any specimens either of North American or of garden origin relevant to the nomenclature of this species.

Gleason, whose passion for nomenclatural stability has become legendary, addressed the nomenclature of the northern species in 1947, in a paper with the stated objective of preserving familiar binomials. By that time the two species had been distinguished as *Parthenocissus quinquefolia* and *P. vitacea*, respectively, by Robinson and Fernald (1908) in the seventh edition of *Gray's Manual* and by Rydberg (1923) in his *Flora of the Rocky Mountains*, ed. 2. Even in 1947,

however, use of the name *P. vitacea* did not prevail completely in widely used references, as the name *P. inserta* had been used in Rehder's (1940) *Manual of Cultivated Trees and Shrubs*, ed. 2, and in Deam's (1940) *Flora of Indiana*. The name *P. inserta* would soon become even more familiar, with the publication of Rehder's (1949) *Bibliography of Cultivated Woody Plants*, Bailey's (1949) *Manual of Cultivated Plants*, ed. 2, Fernald's (1950) revision of *Gray's Manual of Botany*, and Kearney and Peebles' (1951) *Arizona Flora*, ed. 1, in all of which the northern and western species was called *P. inserta*. Had it not been for Gleason's intervention, the name *P. inserta* might quickly have gained general acceptance and use. As it was, Gleason's attempt to preserve and stabilize the use of the name *P. vitacea* did not have the intended effect, but was followed instead by persistent uncertainty and discrepancy among widely used references. It is hoped that this study will help to allay this uncertainty.

Weber and Wittman's (1999) statement that Gleason (1947) had "examined the type [of the name *Vitis inserta*] and found it to be *P. quinquefolia*" is incorrect. Gleason neither mentioned a type specimen nor cited any specimens in relation to the name *Vitis inserta*, nor is any type or specimen appropriate for designation as a lectotype known to exist.

Gleason (1947) quoted Kerner's translated description of the tendrils of *Vitis inserta*, paraphrased above, and followed it with his own interpretation of Kerner's illustration of that species: "Each [tendrill] apex has found a crevice in the bark and has there enlarged into an adhesive disk." He concluded that since "*P. vitacea* is the plant almost always without holdfasts . . . *Vitis inserta* is merely a synonym of *P. quinquefolia*."

The largest tendril shown in Kerner's illustration has entered a crevice in bark, but the figure does not show the tip of that tendril. It does not show what happened with the tip after it entered the crevice, certainly not that it enlarged into an adhesive disc. Nearer the top of the figure another tendril is shown, which appears to terminate in a very small, probably immature, rough-surfaced enlargement, but that part of the figure is not clear as to whether any part of that tendril is concealed in a crevice. This small enlargement does not resemble in size or shape an adhesive disc of *Parthenocissus quinquefolia*.

Kerner had contrasted two species in both of which the tips of the tendril branches produced expanded structures that enabled the vines to cling to the surfaces on which they climbed. The contrast was in the morphology and anatomy of the expanded tendril tips, and the microenvironments conducive to their formation, rather than in the frequency with which such structures were produced. Kerner distinguished *V. inserta*, which according to his own description does not form true discs, the terminal growth of the tendrils specifically being contrasted with discs, and for which "smooth surfaces . . . afford no suitable hold" (Kerner 1887, translation), from *V. quinquefolia*, which produces sticky discs, in a strict definition of discs, and can cling to smooth surfaces. It was not consistent or compatible with Kerner's use of the name *V. inserta*, therefore, to state that he had applied that name to the species that does form true discs and can adhere to smooth surfaces.

Although it appears largely to have been overlooked, perhaps in part because its title mentions only *Parthenocissus quinquefolia*, there is a nomenclatural

study of North American *Parthenocissus* more recent than Gleason's, by Webb in 1967. Webb, who accepted the name *P. inserta* for the northern species, concluded that Kerner's text and illustration of *Vitis inserta* left "no doubt in [his, Webb's] mind as to the type of tendril the author was describing, and this character alone is adequate for diagnosis." This conclusion is the same as that reached in the present study.

Kerner's contrast of the species is compatible with later observations and descriptions, notably those by Voss (1985), who described *Parthenocissus quinquefolia* as having "tendrils with each branch forming an adhesive disc at the end if it comes in contact with a support," and *P. inserta* as having "tendrils not developing discs (although sometimes club-shaped when in a crevice)."

I concur with Webb (1967) that the basionym *Vitis inserta* was originally applied to the species called *Parthenocissus inserta* by Fernald (1950), Voss (1985), and Cooperrider (1995); that is, that *P. inserta* is the correct name for the more northern and western of the two species discussed here.

ACKNOWLEDGMENTS

I am grateful to Natalie Iwanycki for calling my attention to this nomenclatural problem and urging its study, and to the library staff of the Missouri Botanical Garden for access to historic publications. This is Contribution No. 189 from the Royal Botanical Gardens, Hamilton, Ontario, Canada.

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