

A GUIDE TO THE NATURALIZED *NARCISSUS* IN ARKANSAS

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ABSTRACT

Eleven species and interspecific hybrids of *Narcissus* occur outside of cultivation in the Arkansas flora, or in a few cases at least they are long-persistent subsequent to cultivation. Three *Narcissus* taxa, *N. papyraceus* Ker-Gawl., *N. X tenuior* Curt., and an *N. jonquilla* hybrid cultivar, presumably of garden origin, are documented for their first occurrences outside of cultivation in the state. Voucher specimen data are included for the first occurrence records. One additional species of *Narcissus*, *N. bulbocodium* L., also is included because it has been observed persistent from cultivation and increasing in numbers via vegetative production of bulblets (lateral bulbs). A dichotomous key for identification of *Narcissus* taxa is provided, along with state distributions and full-color photos.

The genus *Narcissus*, in the Amaryllidaceae (sometimes merged within the Liliaceae) family, is native predominantly to Europe, with a few species in Asia and northern Africa (Webb 1980; Grey-Wilson & Mathew 1981; Blanchard 1990; Ji & Meerow 2000). The Iberian Peninsula, and more precisely Spain, is regarded as the epicenter for species diversity (Blanchard 1990). The number of species attributed to the genus varies, depending on classification, from about 25–30 species and hybrid taxa (Bailey & Bailey 1976; Webb 1980) to upwards of 60 species (Ji & Meerow 2000), although thousands of horticultural varieties and forms have been recorded (Kington 1998; American Daffodil Society 2010). The taxonomy of the genus is difficult because of the frequency of natural hybridization among the species, along with extensive artificial selection, cultivation, escape, and naturalization (Webb 1980).

Extensive hybridization and horticultural selection have resulted in commercial *Narcissus* cultivars that are in most cases larger and more robust than their parental species, and have given rise to a tremendous level of morphological variation among cultivars (Bailey & Bailey 1976; Hanks 2002), which further contributes to taxonomic ambiguity in the genus. Many *Narcissus* taxa are long-persistent subsequent to cultivation and eventually provide the appearance of naturalization (Straley & Utech 2002). In the USA, including Arkansas, numerous species, hybrids, and cultivars of *Narcissus* are commonly grown and a number have become naturalized in the flora. Naturalized *Narcissus* have traditionally been under-collected and misidentified by field botanists (Spaulding & Barger 2014) and are thus sometimes under-represented in collections and floristic treatments. The bulbs of *Narcissus*

are poisonous, containing the phenanthridine alkaloids narcissine and lycorine, at least one glycoside, and needle-shaped acicular crystals of calcium oxalate (Burrows & Tyrl 2001; Hanks 2002).

Eleven *Narcissus* species and hybrid taxa are spontaneous to naturalized, or at least regularly persistent from cultivation in Arkansas (Gentry et al. 2013; Serviss, unpublished data). Five of these — *N. jonquilla*, *N. papyraceus*, *N. poeticus*, *N. pseudonarcissus*, and *N. tazetta* — are considered distinct, sexually reproducing species, whereas five taxa — *N. X incomparabilis*, *N. X intermedius*, *N. X medioluteus*, *N. X odorus*, and *N. X tenuior* — are intersectional hybrids produced from combinations of species one through five. These hybrids are sexually sterile, but because of extensive cultivation combined with asexual production via bulblets (lateral bulbs—Fig. 1) and various “adventive” methods of propagule dispersal (discussed subsequently) are often as widespread outside of cultivation as their progenitor species (Serviss, unpublished data). Furthermore, long-persistent or spontaneous/naturalized plants of an *N. jonquilla* cultivar of hybrid origin have been collected from a few locations in the state.

One additional species of *Narcissus*, *N. bulbocodium*, also is included in this treatment. *Narcissus bulbocodium* has not been documented outside of cultivation in Arkansas to date; however, it is persistent from cultivation and appears to be increasing in numbers at one location via vegetative reproduction. *Narcissus bulbocodium* also is naturalized in a number of other southern states, including adjacent Louisiana (Thomas & Allen 1993; Nesom 2010; Spaulding & Barger 2014; Weakley 2015; USDA, NRCS 2016) and should be expected outside of cultivation in Arkansas.

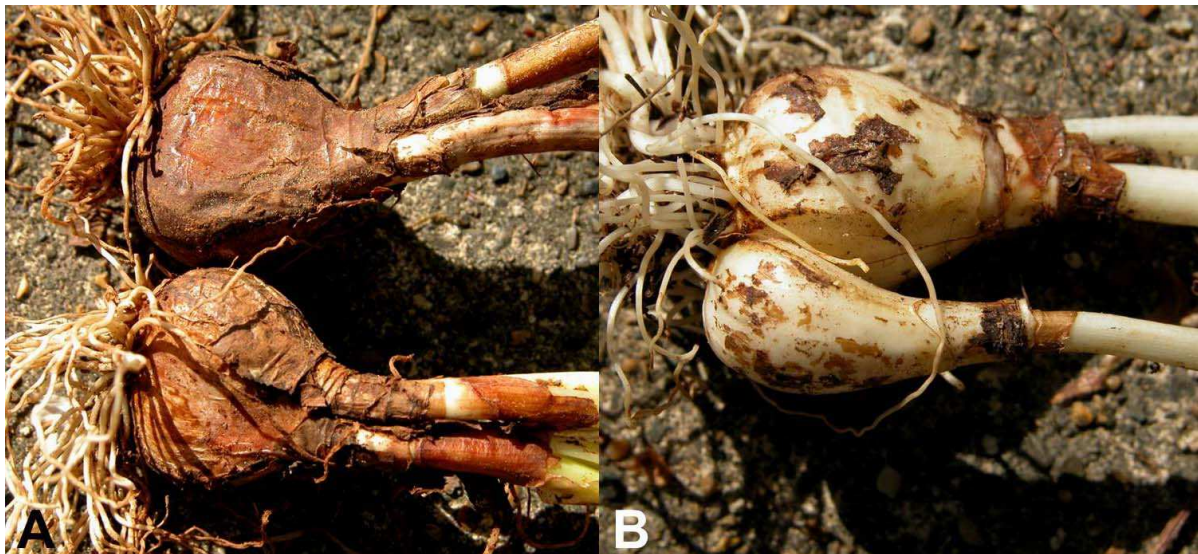


Figure 1. Asexual reproduction in *Narcissus* from lateral bulbs (bulblets). (A) *Narcissus jonquilla* with lateral bulbs that are still enclosed within the original tunic. (B) *Narcissus pseudonarcissus* (probably, as the plants were sterile when the photograph was taken) showing a well-developed lateral bulb (small, lower bulb in the photograph)—notice that it is still attached to the original (parent) bulb.

Of course, the initial presence of *Narcissus* plants in Arkansas is ultimately tied to humans; however, subsequent establishment and naturalization of *Narcissus* in the state’s flora has occurred because of a combination of factors, including asexual and sexual reproduction, along with various anthropogenic activities. *Narcissus* plants may appear as naturalized, or they may be distributed to novel places in the flora and subsequently persist or naturalize through one or more of the following ways (Fig. 2): (1) abandonment and subsequent deterioration of old home sites (provides the illusion of naturalization in that area); (2) dispersal/transport of propagules, such as seeds, bulbs, or whole

plants to different areas via gravity, water, erosion, animals, soil movement, or agricultural/horticultural practices; and (3) intentional or inadvertent distribution by people. All of the aforementioned probably contribute to the extremely widespread distribution of *Narcissus* taxa in Arkansas and elsewhere in the USA.



Figure 2. Naturalized plants of *Narcissus jonquilla* on a roadside in Saline County, Arkansas. Although spontaneous, their source of origin is unknown (photo credit Jim Keesling).

The photographs in Fig. 3 show plants of *Narcissus pseudonarcissus* in a pasture in Bismarck, Arkansas. These plants have been present in this pasture since prior to the 1960s; originally, this area was an old home site (the *N. pseudonarcissus* plants were introduced and planted sometime prior to that time). The current distribution of the plants reflects a pattern that is commonly observed when bulbs are transported from one place to another via disking, plowing, or other soil disturbance activities generated from agricultural machinery, which occurred in this pasture 40 to 50 years ago. Although seed production likely occurs among these plants, apparently only minimal establishment is occurring in this fashion (Fig. 3B). Over time, one or a few plants will produce large, tightly packed clumps via asexual/vegetative production of bulblets from larger, subterranean bulbs. Hence, these small, isolated plants shown in Fig. 3B were probably not produced vegetatively.

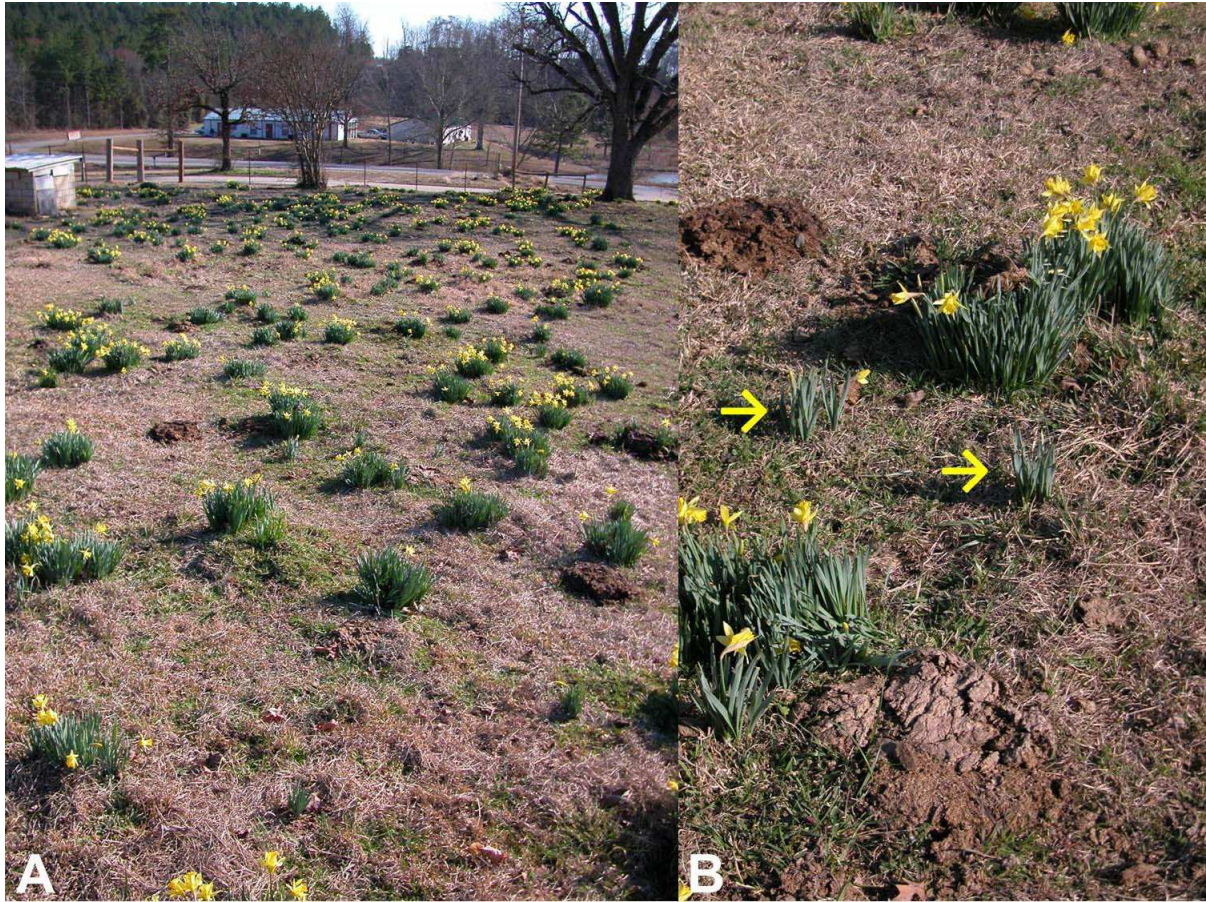


Figure 3. Plants of *Narcissus pseudonarcissus* in a pasture in Bismarck, Arkansas. Their origin is uncertain but plants are spreading vegetatively via bulblets and also possibly via seeds. (A) View of a portion of the pasture. (B) Two small, isolated clumps of “spontaneous” plants that obviously have been produced only in the recent past are indicated by yellow arrows.



Figure 4. Naturalized plants of *Narcissus pseudonarcissus* in a disturbed woods in Bismarck, Arkansas.



Figure 5. Spontaneous plants of *Narcissus pseudonarcissus*. (A–B) Two separate sets of small, spontaneous plants of *N. pseudonarcissus* in a disturbed woods in Bismarck, Arkansas. These plants likely were produced via seeds.

The photographs in Figs. 4–5 are of a wooded area immediately adjacent to the aforementioned pasture, where several decades ago, the pasture was bulldozed, and soil containing bulbs was transported to the wooded area. The transported bulbs subsequently established, and over time, the founder plants gave rise to an extensive population with numbers of individuals much in excess of that shown in the photograph. Again, while asexual reproduction also has been the predominant factor in increasing the number of plants in this area (notice the clumps — these would have started from only one to a few bulbs), seed production likely also is occurring (notice the small plants in Fig. 5; of course, the activity of burrowing animals also could potentially be the cause of these small plants through redistribution of the soil from digging or burrowing where bulbs are separated from the main clump and moved to an adjacent location).

The plants in Fig. 6 are in a pasture in the vicinity of Donaldson, Arkansas, where, via disking activities by farm machinery, cultivated plants were redistributed, forming a mosaic pattern of different kinds of *Narcissus*. One of these, a sterile, interspecific hybrid (*N. X odorus*) is incapable of seed production; however, it has still increased its numbers through vegetative reproduction.

The photographs in Figs. 7–8 show a pasture near Friendship, Arkansas with a somewhat similar pattern as observed in Donaldson. Although the method of spread is not known for these plants, because the plants are all *N. X medioluteus*, another sterile, interspecific hybrid, it is reasonable to surmise, at least in part, that the observed pattern of plants was created through mechanical redistribution of soil and bulbs via disking. Interestingly, a single plant of *N. X odorus* also was growing among the *N. X medioluteus* plants at this site.



Figure 6. Plants of *Narcissus pseudonarcissus* and *N. × odorus* in a pasture in the vicinity of Donaldson, Arkansas. The observed pattern of plants stems from once cultivated plants of these species that later were redistributed in the pasture via disking.

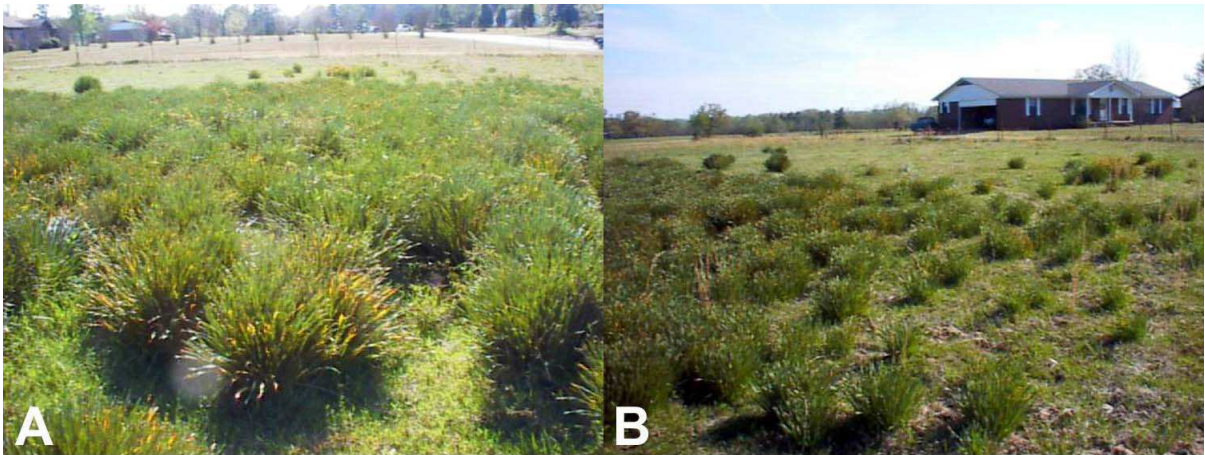


Figure 7. Plants of *Narcissus × medioluteus* in a pasture in the vicinity of Friendship, Arkansas. (A) Evidence of long-term vegetative reproduction via bulblets (notice the large diameter, tightly crowded clumps of plants). (B) Several smaller clumps of *N. × medioluteus* plants at the edge of the population; possibly distributed at a later time to this portion of the pasture via soil movement.



Figure 8. Plants of *Narcissus X medioluteus* in a pasture in the vicinity of Friendship, Arkansas. Their origin is uncertain but plants are spreading vegetatively via bulblets. These plants have been in the pasture for a number of years.

Key to Species of *Narcissus* Typically Encountered in the Arkansas Flora as Naturalized or Persisting Subsequent to Cultivation

In regard to identification of *Narcissus*, it is important to note that certain characteristics, such as flower size and coloration, position and shape of floral organs (perianth segments or corona), and leaf width, may be highly variable within a species, or even sometimes among individuals of the same population (Blanchard 1990). Fluctuations in environmental conditions, such as excessive or too little moisture, may contribute to differences in flower morphology if the plant is exposed to such during flower development. Furthermore, with age, flowers may change in color, or floral organs or the flower itself may shift in position. For example, perianth segments may become more reflexed or flowers may shift from drooping to ascending (Blanchard 1990). Flowers also will continue to grow and enlarge once they emerge from the spathe.

Please also consider that the following key should only be used with plants that are encountered as spontaneous to naturalized or clearly persisting from cultivation. Most of the modern cultivars and hybrids commonly found in cultivation will not key properly here, or if keyed, may cause identification errors.

1. Flowers “doubled”—corona not cuplike or tubular, but instead, dissected into numerous segments and often most or all of the stamens sterile and petaloid; plants sterile.

2. Leaves terete to subterete or concave and channeled.

- 3. Leaves terete to subterete **Narcissus jonquilla**
- 3. Leaves concave with an obvious channel along their length **Narcissus X odorus**

2. Leaves flattened.

- 4. Flowers green maturing to yellow–green or sometimes yellow, segments of the corona yellow, occasionally some also orange; lobes of the corona as long or longer than the perianth **Narcissus pseudonarcissus**
- 4. Flowers creamy–yellow to yellow, segments of the corona orange; lobes of the corona shorter than the perianth segments **Narcissus X incomparabilis**

1. Flowers typical—corona cuplike or tubular; stamens with typical anthers and filaments present—not petaloid; plants fertile species or sterile interspecific hybrids.

5. Leaves narrow, usually 7(8) mm or less wide, terete, subterete, or concave (curved inward and somewhat flattened on one side), or with a shallow groove on the adaxial surface—these leaves may be somewhat flattened.

- 6. Perianth segments linear, or lanceolate–elliptic and deflexed away from the corona; leaves 3 mm or less wide (usually 1–2 mm wide) **Narcissus bulbocodium**
- 6. Perianth segments much wider; at least some leaves 3 mm wide or wider.

7. Flowers (3.5)4 cm wide or wider; perianth segments narrowly elliptic or ovate–elliptic, or subrotund or broadly ovate to ovate–elliptic, if rotund or broadly ovate to ovate–elliptic, than often with dark yellow and pale yellow to cream coloration on the perianth segments.

- 8. Corona and perianth concolorous (the same color); perianth segments narrowly elliptic to ovate–elliptic, widely spaced and not overlapping with one another or only so basally, uniformly yellow, typically less than 1.5 cm wide; flowers occasionally with only 3–5 perianth segments present (commonly encountered taxon) **Narcissus X odorus**
- 8. Corona darker in color (sometimes only slightly so) than the perianth segments; perianth segments broadly ovate, ovate–elliptic, or subrotund, clearly overlapping, often two–toned with dark yellow and whitish to cream coloration on the same segment, especially in older flowers, segments of perianth typically 1.5 cm wide or wider (occasionally encountered taxon) **Narcissus sp. (N. jonquilla hybrid cultivar)**

7. Flowers 1–3.3(3.5) cm in diameter; perianth segments rotund or broadly elliptic to ovate, about as long as wide.

- 9. Perianth and corona essentially concolorous; bright yellow or golden–yellow, occasionally corona slightly darker than perianth; perianth segments with the margins not folded or curved; leaves essentially terete to subterete, sometimes also with a narrow flattened area or groove along the adaxial surface **Narcissus jonquilla**
- 9. Perianth yellow, pale yellow, cream–colored, or nearly white, corona orange, yellow, or cream–colored, always darker than the perianth; perianth segments with the margins

folded or not; leaves concave (curved inward and somewhat flattened on one side) or mostly flattened.

10. Flowers 3–7 per inflorescence; at least some of the perianth segments with the margins folded or curved inward, segments yellow; corona deep yellow to orange
 **Narcissus X intermedius**

10. Flowers 1–2(3) per inflorescence; perianth segments without the margins folded inward, segments pale yellow to almost white; corona lemon yellow
 **Narcissus X tenuior**

5. Leaves flattened, generally 7 mm wide or wider (sometimes narrower than 7 mm in *N. papyraceus*, *N. poeticus*, and *N. tazetta*, but then clearly flattened).

11. Corona as long or longer than the perianth segments **Narcissus pseudonarcissus**

11. Corona clearly shorter than the perianth segments.

12. Flowers (2)4–15(20) per umbel, 2–5(5.5) cm or less in diameter, strongly fragrant.

13. Corona yellow or orange and clearly darker in color than the perianth
 **Narcissus tazetta**

13. Corona white and perianth white, or corona occasionally off–white to very pale creamy–white and perianth segments white **Narcissus papyraceus**

12. Flowers 1–3(4) per umbel, 4.5 cm or more in diameter, fragrant or not.

14. Flowers solitary.

15. Corona much less than one-half as long as the perianth segments, margin of corona red and sometimes scarious, rarely lacking the red pigmentation and margin only scarious; perianth white to very pale creamy–white **Narcissus poeticus**

15. Corona one–half to three–quarters as long as the perianth segments, margin of corona not red or scarious; perianth usually pale yellow, rarely white
 **Narcissus X incomparabilis**

14. Flowers 2(3) per inflorescence, occasionally an inflorescence may have 1 or 4 flowers.

16. Perianth white, segments usually with a small amount of yellow coloration at the base adjacent to corona, corona yellow; leaves completely flattened
 **Narcissus X medioluteus**

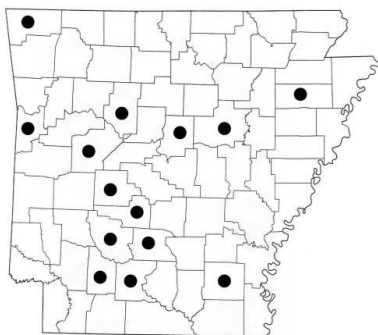
16. Perianth bright to pale yellow, sometimes two–toned with bright and pale yellow coloration, corona yellow to orange; leaves often concave at least along the upper one–third to one–half **Narcissus sp. (N. jonquilla hybrid cultivar)**

***Narcissus bulbocodium* L. – HOOP-PETTICOAT DAFFODIL (Fig. 9)**

Narcissus bulbocodium is native to open and rocky areas of Portugal, Spain, and France (Webb 1980). It is unlike other species of *Narcissus* in the state in that the perianth segments are linear. *Narcissus bulbocodium* is occasionally planted in Arkansas but has not been documented outside of cultivation in the state. It has, however, been documented outside of cultivation in Alabama, adjacent Louisiana, and North Carolina (Thomas & Allen 1993; Spaulding & Barger 2014; Weakley 2015), and should be expected outside of cultivation in Arkansas. Disturbed woods, woodland edges, roadsides, and naturalized or persisting in lawns. Flowering February–April.



Figure 9. *Narcissus bulbocodium*. (A & C) Flowers. (B) Plants and leaves.

***Narcissus X incomparabilis* Mill. – PEERLESS DAFFODIL; NONSUCH DAFFODIL (Figs. 10–11)**

Narcissus X incomparabilis is a sterile, intersectional hybrid between *N. poeticus* and *N. pseudonarcissus* that is native to France and probably of natural origin (Webb 1980). This taxon is vigorous and long-persistent subsequent to cultivation, often spreading vegetatively via bulblets, and is one of the most commonly encountered *Narcissus* in Arkansas. Plants of *N. X incomparabilis* are easily confused with *N. pseudonarcissus* because of the large, solitary flowers and flattened, glaucous leaves; however, it may be distinguished from *N. pseudonarcissus* by its corona, which is only about one-half to three-quarters as long as the perianth segments.

In contrast, the flowers of *N. pseudonarcissus* have a corona that is as long or longer than the perianth segments. Disturbed woods, woodland edges, pastures, fields, roadsides, and old home sites. Flowering February–April.



Figure 10. *Narcissus X incomparabilis*. (A–D) Flowers (Fig. B is of a “doubled” flower where the corona is divided and at least some of the stamens have been modified to form petals; Fig. C shows a white-colored flower form of *N. X incomparabilis*, which is occasionally encountered; Fig. D shows a flower with additional perianth segments above the 6 that are typical—*N. X incomparabilis* occasionally produces flowers with 7 or 8 perianth segments and up to as many as 12 have been observed in Arkansas plants).

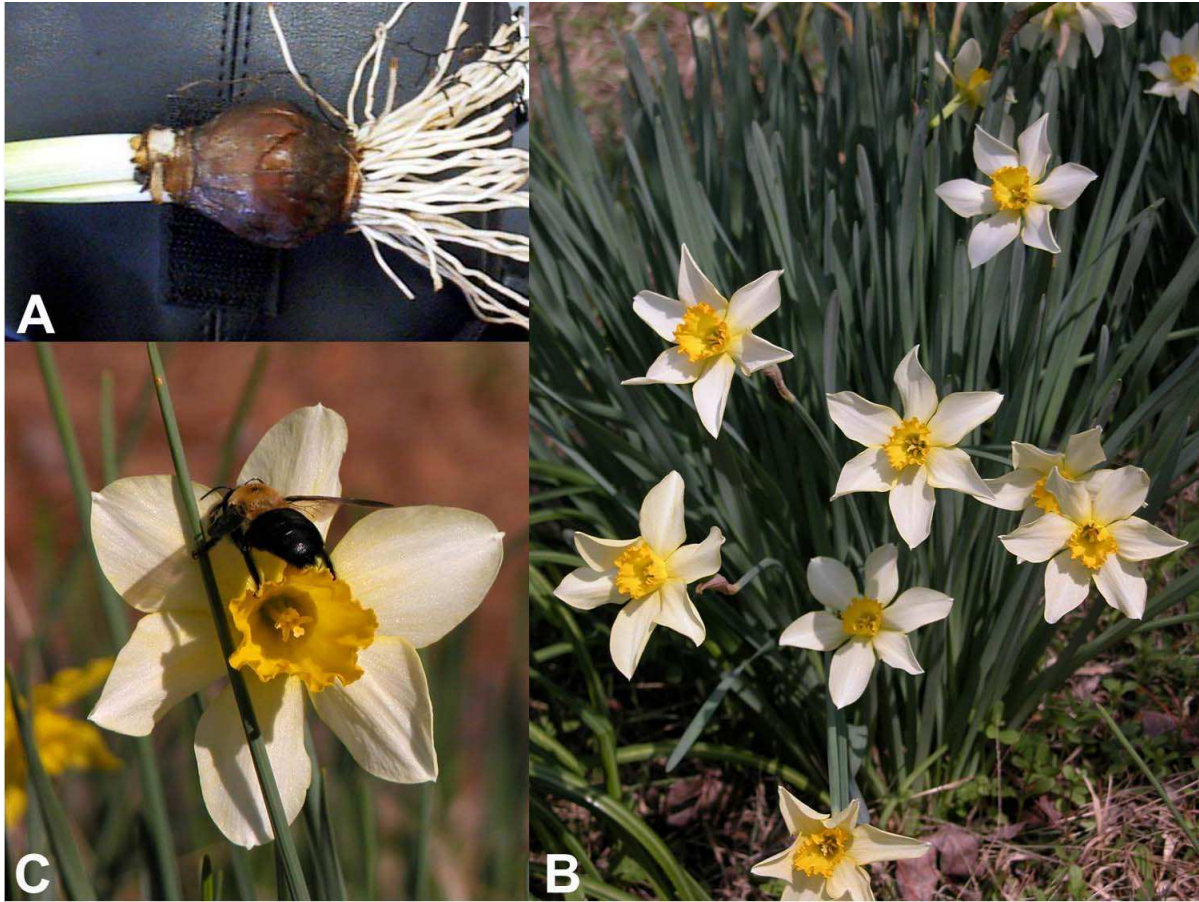
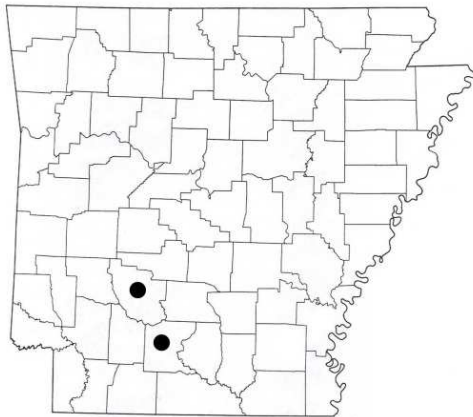


Figure 11. *Narcissus X incomparabilis*. (A) Bulb and roots. (B) Plants. (C) Hymenopteran on flower.

***Narcissus X intermedius* Loisel. – STAR JONQUIL (Fig. 12)**



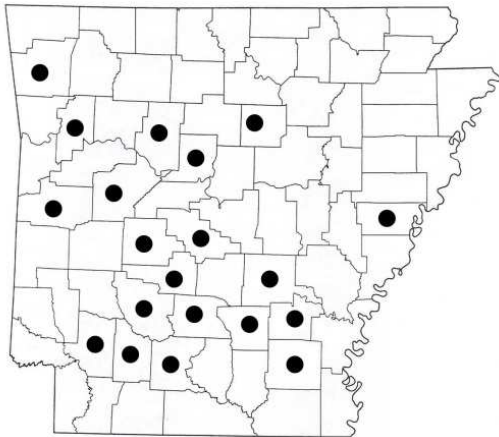
Narcissus X intermedius is a sterile, intersectional hybrid between *N. jonquilla* and *N. tazetta* that is native to the Mediterranean region; it is perhaps a naturally occurring hybrid (Webb 1980). *Narcissus X intermedius* is fairly similar in appearance to *N. jonquilla*; however, it may be distinguished from *N. jonquilla* by its channeled, concave leaves, orange-colored corona that is darker than the perianth, and perianth segments that are folded inward at their margins. In contrast, *N. jonquilla* has terete to subterete leaves, generally concolorous flowers with a yellow corona, and perianth segments that are generally not folded along the margins. The two species, however, are easily confused without close examination, especially

when viewing herbarium specimens. *Narcissus X intermedius* is rarely encountered outside of cultivation in Arkansas, although it is probably more common in the flora than current records indicate. Pastures, fields, roadsides, and old home sites; tolerant of periodically wet soils. Flowering February–March; flowers fragrant.



Figure 12. *Narcissus X intermedius*. (A) Flowers and inflorescence. (B) Plants. (C) Close-up of flower; notice that the corona is darker in color than the perianth segments, which aids in distinguishing it from *N. jonquilla*. (D) Bulb and roots.

***Narcissus jonquilla* L. – JONQUIL (Figs. 13–14)**



Narcissus jonquilla is a narrow-leaved and dainty species of *Narcissus* with strongly fragrant flowers that is native to open and damp places of Portugal and Spain (Webb 1980). It is extensively cultivated for its extremely fragrant flowers, which are sometimes used in perfumery, and it is naturalized in many areas of Europe and the USA (Webb 1980; Straley & Utech 2002). *Narcissus jonquilla* is one of the most commonly cultivated *Narcissus* species in Arkansas and is regularly encountered outside of cultivation in the state. It probably naturalizes via seed production as well as asexually, as plants readily produce seed in Arkansas (Fig. 13D). The flowers of *N. jonquilla* are typically

concolorous, where the perianth segments and corona are the same color; however, plants are occasionally encountered with flowers where the corona is darker in color than the perianth segments. *Narcissus jonquilla* is tolerant of periodically wet soils and readily naturalizes in lawns and other open, disturbed sites. Disturbed woods, woodland edges, hillsides, pastures, fields, roadsides, lawns, and old home sites. Flowering February–April. Fruiting April–June.

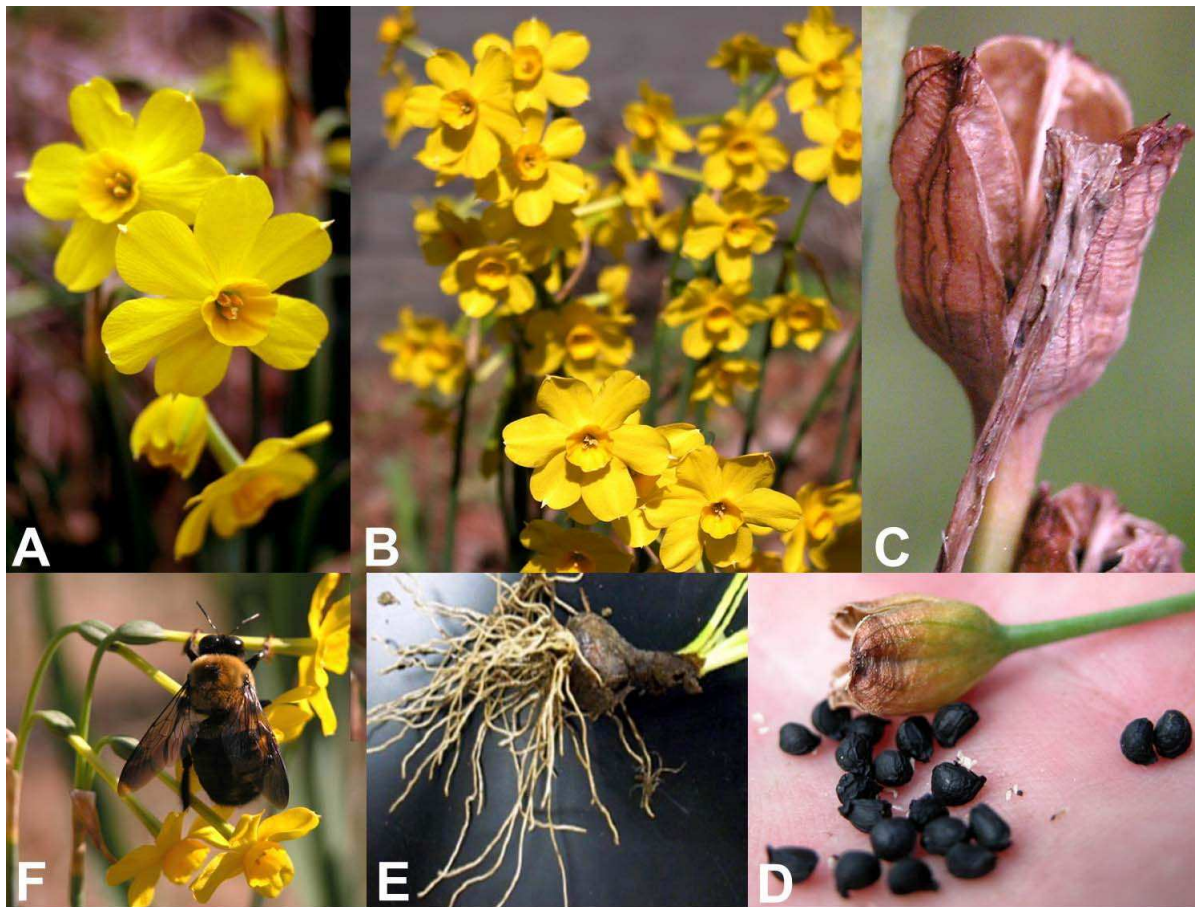


Figure 13. *Narcissus jonquilla*. (A–B) Flowers and inflorescences. (C) Mature fruit. (D) Mature fruit and seeds (from Arkansas plants of *N. jonquilla*). (E) Bulb and roots. (F) Hymenopteran on flowers.

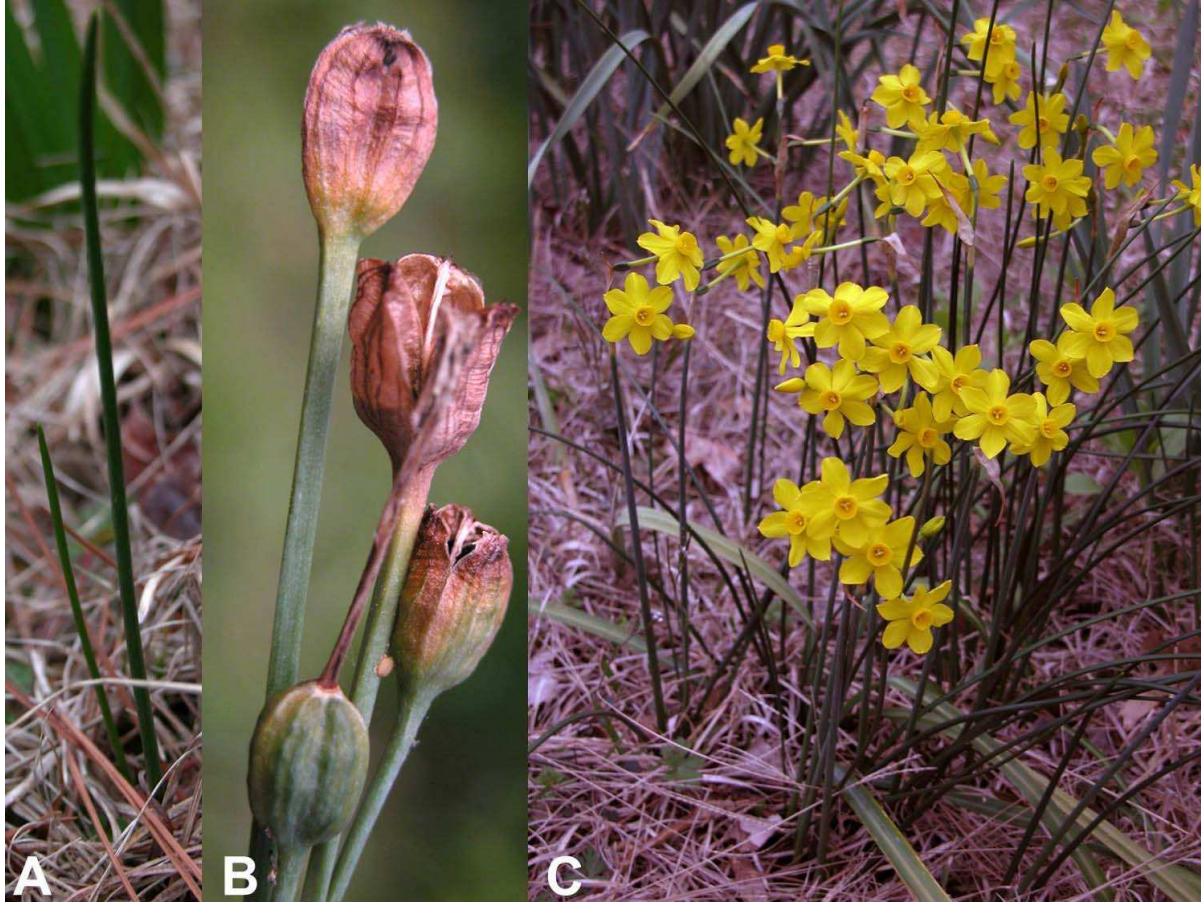


Figure 14. *Narcissus jonquilla*. (A) Spontaneous juvenile plant from seed. (B) Mature fruits and infructescence. (C) Plants.

***Narcissus* sp.** (*N. jonquilla* hybrid cultivar) (Fig. 15)



This *Narcissus* taxon has small to medium-sized (ca. 4–5.5 cm in diameter), yellow-colored, sweetly fragrant flowers that generally occur 2–3 per inflorescence, although solitary flowers also are sometimes produced. The corona is slightly darker in color than the perianth. These plants approach the growth form and floral morphology of the *N. jonquilla* hybrid cultivars ‘Circuit’, ‘Penpol’, ‘Stratosphere’, and ‘Trevithian’, although nevertheless seem possibly distinct from them. The leaves are linear, concave and channeled and somewhat similar to those of *N. X intermedius* and *N. X odorus*; however, they are often wider and more flattened. This taxon

is a robust and showy plant that is occasionally cultivated but long-persistent from cultivation and possibly sparingly naturalized in Arkansas. The pale, nearly white to whitish cream areas of the perianth often develop as the flowers age. This taxon has not previously been recorded from Arkansas. Disturbed woods, fields, roadsides, lawns, and old home sites. Flowering March–April.

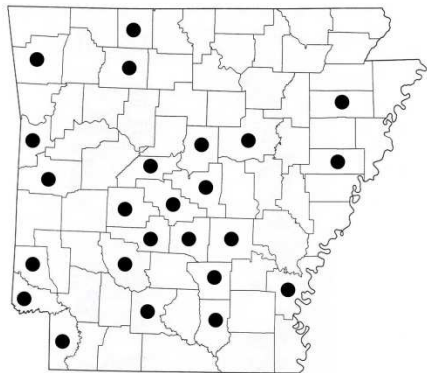
Voucher specimens. **Arkansas.** Clark Co.: Arkadelphia, along Hwy I-30 East, adjacent to intersection of Professional Drive and Pine Street, disturbed roadside along fencerow, one clump of isolated, “spontaneous” plants growing ca. 1–1.5 m away from hundreds to possibly thousands of

plants along fencerow that apparently were long-persistent from cultivation—these plants appeared to be increasing vegetatively via bulblets, 12 Mar 2016, *Serviss 8213* (HEND); Arkadelphia, Walnut Street, about 500 yards W of 26th Street, disturbed woods and adjacent yard, plants present and persisting or possibly escaping into woods from what appears to be originally cultivated plants, 3 Mar 2002, *Serviss 5079* (HEND); Okolona, Junction 51 on Hwy 82, roadside and adjacent semi-disturbed field, a few plants, possibly naturalized or long-persistent from cultivation, 3 Apr 2002, *Serviss 5083* (HEND). Hot Spring Co.: Hwy 128 E, about ¼ mi S of Caney Road, disturbed roadside, three clumps of naturalized plants, 21 Mar 2003, *Serviss 5119* (HEND).



Figure 15. *Narcissus* sp. (*N. jonquilla* hybrid cultivar). (A) Flowers and inflorescences. (B) Plants (the flowers on these plants are young and have little to no fading of the perianth segments). (C) Close-up of flowers showing fading on perianth segments.

***Narcissus* × *medioluteus* Mill. – TWIN SISTERS (Fig. 16)**



Narcissus × *medioluteus* is a sterile, intersectional hybrid between *N. poeticus* and *N. tazetta* and is probably a naturally occurring hybrid that originated in southern France (Webb 1980). *Narcissus biflorus* Curt. is a frequently encountered synonym for this taxon. *Narcissus* × *medioluteus* commonly is planted and frequently encountered in the Arkansas flora outside of cultivation. It is an extremely vigorous grower and reproduces asexually via bulblets. One of the characteristics that helps distinguish *N. X medioluteus* from other *Narcissus*

taxa is the bright yellow coloration found at the base of the perianth segments; note that some forms of *N. poeticus* and *N. tazetta* also may have similar coloration on the perianth segments. *Narcissus X medioluteus* is the latest flowering *Narcissus* in Arkansas. Disturbed woods, woodland edges, hillsides, pastures, fields, roadsides, and old home sites. Flowering March–May.

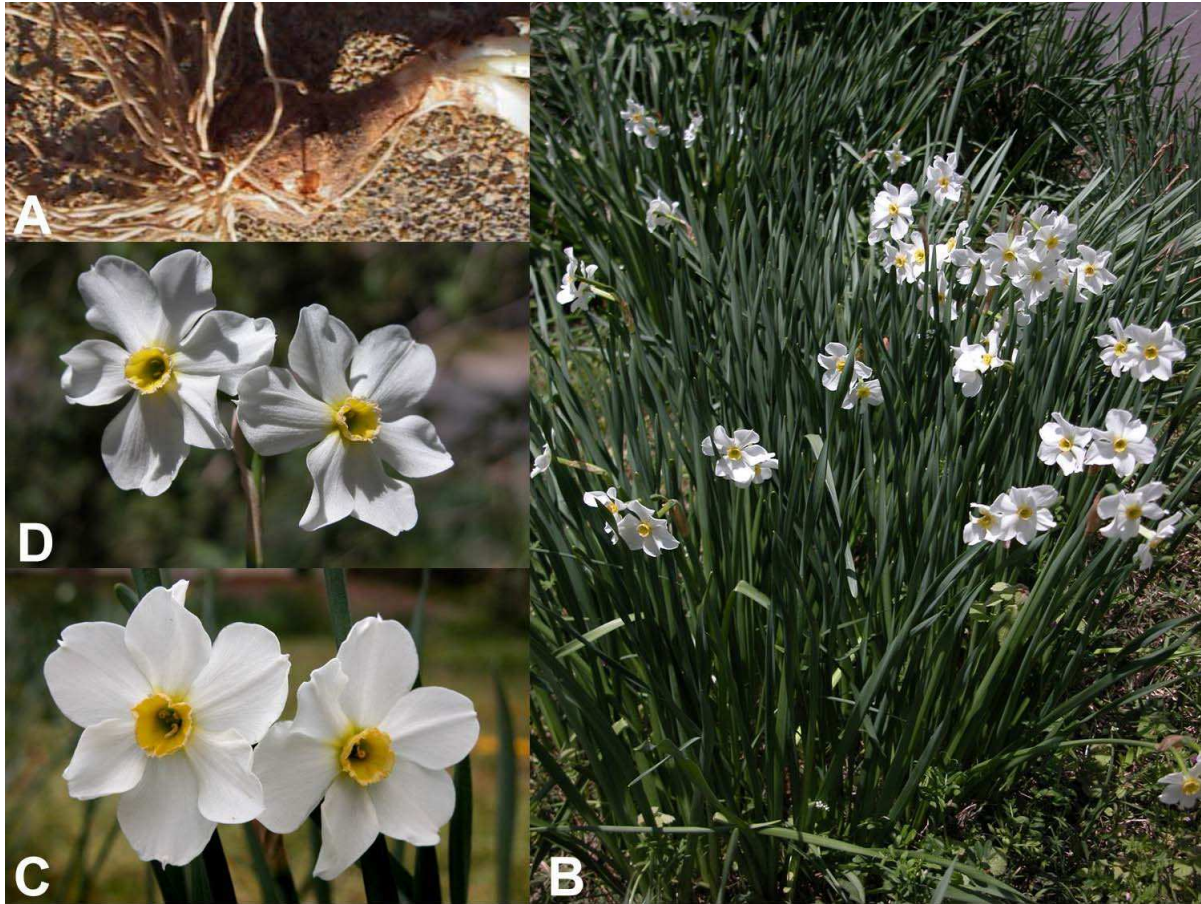
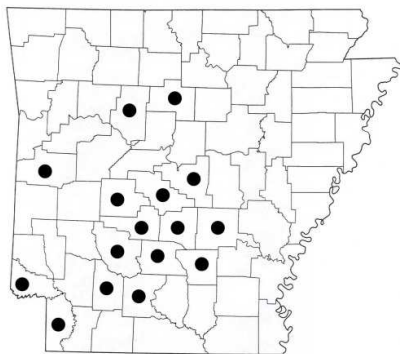


Figure 16. *Narcissus X medioluteus*. (A) Bulb and roots. (B) Plants. (C–D) Flowers and inflorescences.

***Narcissus X odorus* L. – CAMPERNELLE JONQUIL; SWEET-SCENTED JONQUIL (Fig. 17)**



Narcissus X odorus is a sterile, intersectional hybrid between *N. jonquilla* and *N. pseudonarcissus*; it is probably of garden origin (Webb 1980). It has become naturalized in both Europe (where the parental species are native) and the USA, including Arkansas. This taxon is one of the most frequently cultivated *Narcissus* in the state and also one of the most commonly encountered outside of cultivation. Vegetatively, *N. X odorus* closely resembles *N. jonquilla*, *N. X intermedius*, and *Narcissus* sp.; however, it may reliably be distinguished from them by its flowers with narrowly elliptic to ovate-elliptic, widely-spaced perianth segments. In contrast, all three of the vegetatively similar taxa have

overlapping to nearly overlapping perianth segments that are broadly ovate, obovate, or subrotund. The flowers of *N. X odorus* also are larger than those of *N. jonquilla* and *N. X intermedius*. *Narcissus X odorus* is a hardy and vigorous plant that increases its numbers through asexual production of bulblets. Woodland edges, hillsides, pastures, fields, roadsides, ditches, and old home sites. Flowering February–April.

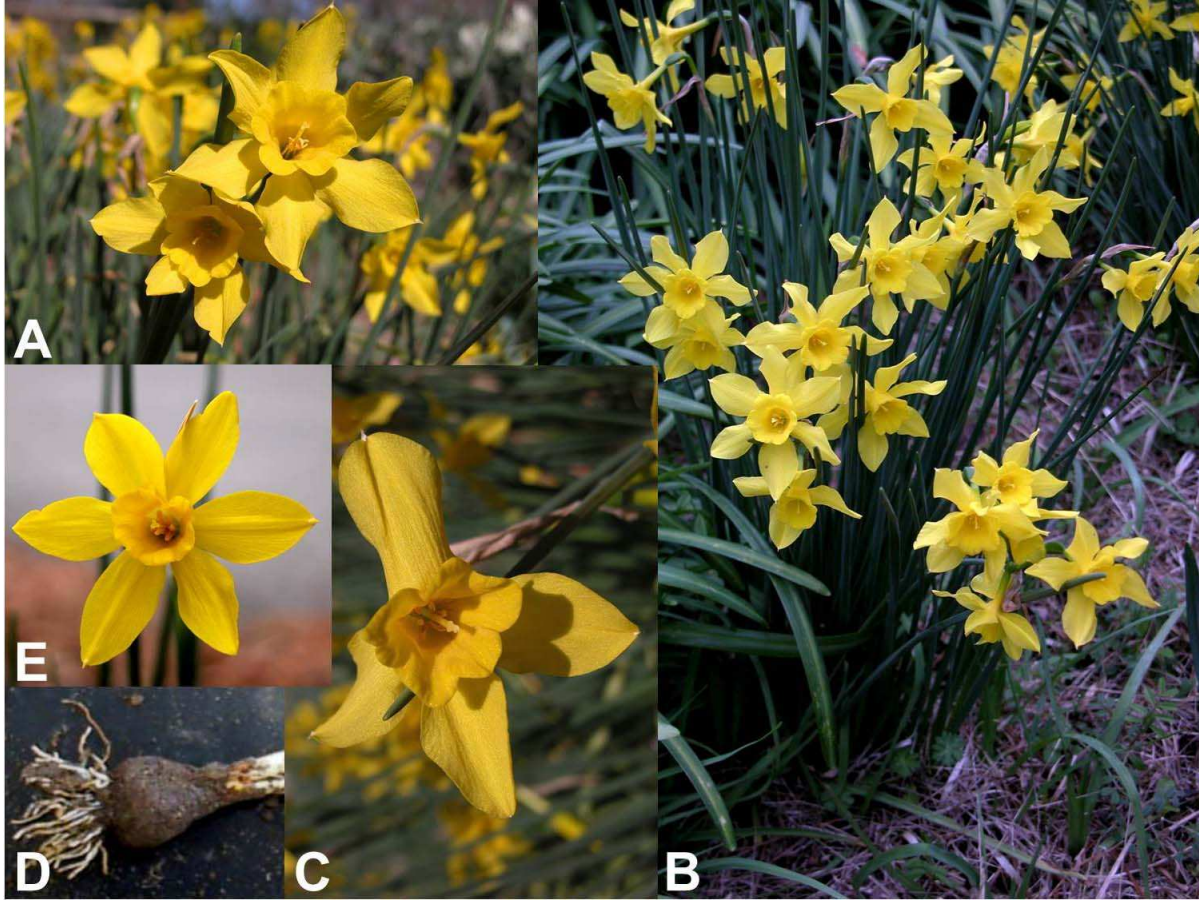


Figure 17. *Narcissus X odorus*. (A & E) Flowers and inflorescences. (B) Plants. (C) Flower with missing perianth segments; it is occasional in *N. X odorus* to have flowers with 3, 4, or 5 perianth segments instead of the 6 that are typical. (D) Bulb and roots.

***Narcissus papyraceus* Ker–Gawl. — PAPER–WHITE NARCISSUS (Figs. 18–19)**



Narcissus papyraceus is native to the Mediterranean region and southern Europe (Webb 1980). It is occasionally cultivated in Arkansas and long-persistent, with cultivated plants having been observed increasing vegetatively via bulblets. *Narcissus papyraceus* has been documented as naturalized from a number of other states, including Alabama, California, Louisiana, and Texas (Thomas & Allen 1993; Nesom 2010; USDA, NRCS 2016), but until 2016 it had not been documented from the Arkansas flora. *Narcissus papyraceus* has sometimes been considered conspecific with the morphologically similar *N. tazetta*; being treated as only a variety of it [*N. tazetta* var. *papyraceus* (Ker–Gawl.) Baker]. The two species are morphologically similar and intergrade in most characteristics (Webb 1980). Fresh material of *N. papyraceus* and *N. tazetta* may, however, generally be distinguished by differences in flower color—the corona and perianth segments of *N. papyraceus* flowers are typically concolorous and white, whereas the corona of *N. tazetta* flowers is yellow or orange and generally clearly darker in color than the perianth segments. The color differences of the flowers often become obscured on dried material, and the two species are difficult to differentiate among herbarium specimens; hence, positive identification is best

accomplished using fresh material (Straley & Utech 2002). It also is important to note that some forms of *N. papyraceus* have cream to off-white-colored coronas that are darker in color than the perianth segments (Blanchard 1990; Howard 2001). The distinction between *N. tazetta* and *N. papyraceus* may be further confounded in that certain “*tazetta*” cultivars, such as ‘Grand Primo’, ‘White Pearl’, and ‘Polly’s Pearl’, among others, are apparently interspecific hybrids of garden origin between *N. tazetta* and *N. papyraceus* that have pale yellow, cream, or off-white coronas that sometimes fade to white as they age (Howard 2001). These plants closely resemble *N. papyraceus* in growth form and flower color, particularly as the flowers age. The Miller County plants of *N. papyraceus* have young flowers with off-white to pale cream coronas that fade to white as they age (Fig. 19). It is not inconceivable that these *N. papyraceus* plants may, in fact, be one of the aforementioned hybrid *tazetta* cultivars. Regardless, they were spontaneous along a roadside with no apparent evidence of prior cultivation present at the site. *Narcissus papyraceous* is the earliest flowering species of *Narcissus* in Arkansas, sometimes flowering in late autumn; the flowers are strongly sweet-fragrant. Roadsides, fields, lawns, and other disturbed areas. Flowering November–March.

Voucher specimen. **Arkansas.** Miller Co.: County Road (CR) 118, 0.1 mi N of the intersection of CR 118 and US Hwy 82, open field on W side of road, sandy soils, 6 widely separated plants, 28 Feb 2016, *Keesling 16-0007* (ANHC).

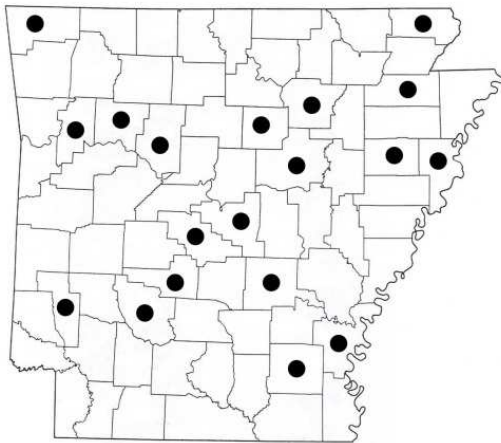


Figure 18. *Narcissus papyraceus* (standard paper-whites). (A) Inflorescence and flowers. (B) Plants. (C) Close-up of flowers.



Figure 19. *Narcissus papyraceus*. (A) Naturalized plants in Miller County, Arkansas. (B) Plants with young and older flowers; some of the younger flowers with off-white to pale cream-colored coronas are indicated by the yellow arrows (photo credit Jim Keesling).

***Narcissus poeticus* L. – PHEASANT’S EYE; POET’S NARCISSUS (Fig. 20)**



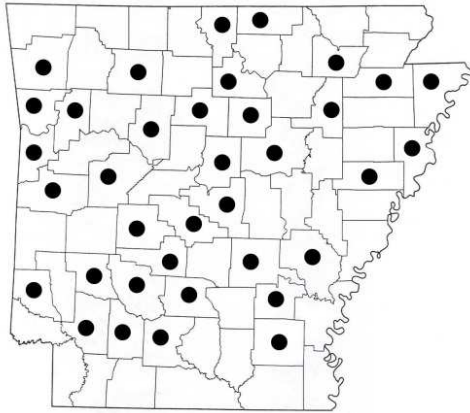
Narcissus poeticus is native to open areas of southern Europe (Webb 1980). It is sometimes cultivated and naturalized in Arkansas. It is the only *Narcissus* species found in Arkansas with a red margin on the corona. Although the perianth segments are usually white, young flowers sometimes have cream to creamy-yellow coloration on the perianth. *Narcissus poeticus* is somewhat similar to, and could potentially be confused with, *N. X medioluteus*; however, it may easily be distinguished from *N. X medioluteus* by its solitary flowers and corona with a red-colored margin. In contrast, *N. X medioluteus* has most inflorescences with two flowers and the margin of the corona is yellow, not red. Fields, roadsides, and old home sites. Flowering March–April.

Fields, roadsides, and old home sites. Flowering March–April.



Figure 20. *Narcissus poeticus*. (A & D) Flowers (notice the creamy–yellow coloration on the base of the perianth segments of the flower in Fig. D). (B) Plants. (C) Bulb and roots.

***Narcissus pseudonarcissus* L. – TRUMPET NARCISSUS; DAFFODIL (Figs. 21–22)**



Narcissus pseudonarcissus is a highly variable species that is native to much of Europe, and is commonly cultivated and has naturalized much beyond its native range in Europe (Webb 1980). It also is frequently cultivated and naturalized in the USA, including Arkansas, and is the most commonly encountered species of *Narcissus* in the state. It probably naturalizes (in Arkansas) from a combination of seed production and vegetative reproduction via bulblets. Arkansas plants of *N. pseudonarcissus* sometimes produce seeds (Fig. 22A). *Narcissus pseudonarcissus* may be distinguished from all other Arkansas *Narcissus* by its corona, which is as long or longer than the perianth segments. Other *Narcissus*

species encountered in the state's flora have a corona that is clearly shorter in length than the perianth segments. Disturbed woods, woodland edges, hillsides, pastures, fields, roadsides, lawns, and old home sites. Flowering January–March. Fruiting March–June.

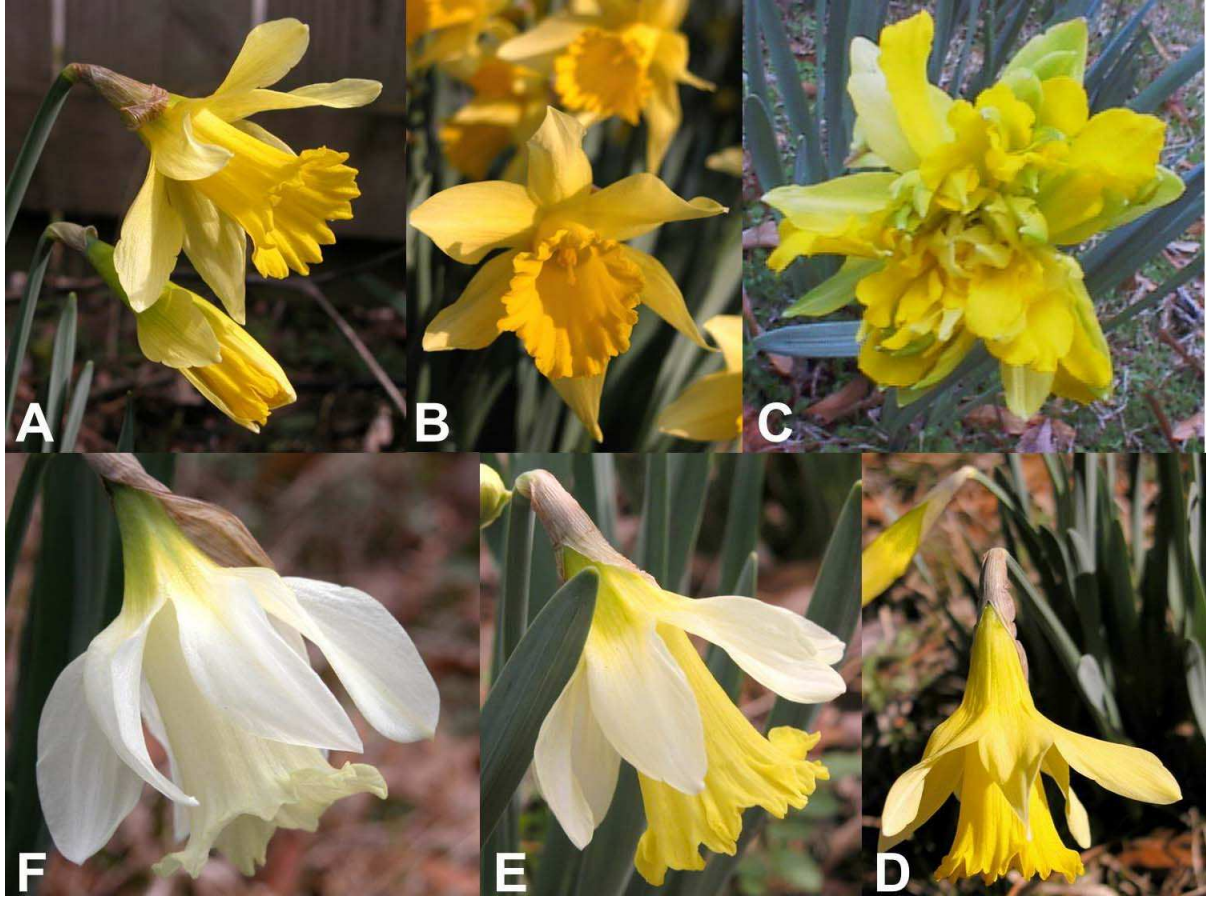


Figure 21. *Narcissus pseudonarcissus*. (A–F) Flowers (Fig. C shows a “doubled” form, where the perianth segments are dissected and some to all of the stamens have been converted to petals; Fig. F shows a white-flowered form, possibly *N. pseudonarcissus* L. subsp. *moschatus* (L.) Baker (sometimes considered a distinct species, *N. moschatus* L.) that is occasionally encountered in Arkansas; Figs. A and D show the wild-type flower form).

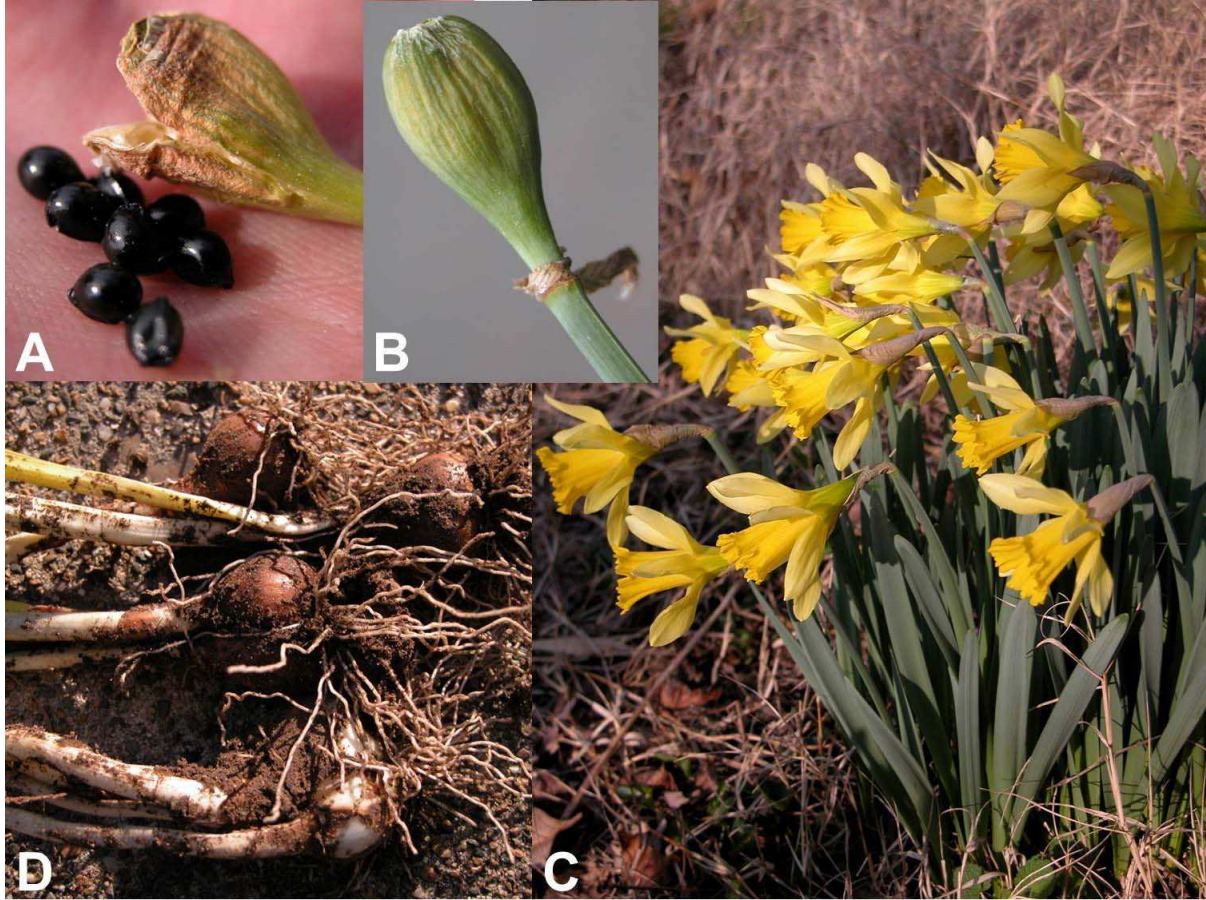
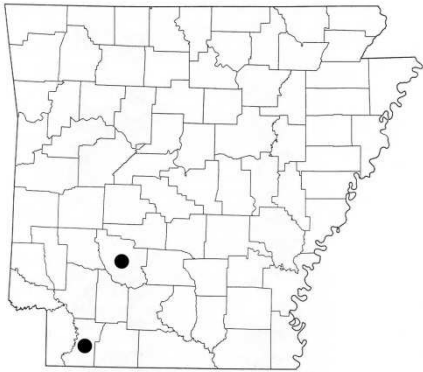


Figure 22. *Narcissus pseudonarcissus*. (A) Mature fruit and seeds (from Arkansas plants of *N. pseudonarcissus*). (B) Nearly mature fruit. (C) Plants. (D) Bulbs and roots.

***Narcissus tazetta* L. – POLYANTHUS NARCISSUS; BUNCH-FLOWER DAFFODIL (Figs. 23–24)**



Narcissus tazetta is a robust species with strongly fragrant flowers that is native to open areas of southern Europe, Asia, and North Africa (Webb 1980; Ji & Meerow 2000). It is rare in the Arkansas flora outside of cultivation. *Narcissus tazetta* is a highly polymorphic species, showing tremendous variation with regard to flower size and color, number of flowers per inflorescence, and leaf width. For example, perianth segments may range in color from white or cream to yellow, and the corona from pale to dark yellow or orange. The width and degree of overlap of the perianth segments also is variable. This high degree of morphological variation is at least in part

because of artificial selection, as *N. tazetta* has been cultivated for centuries (Webb 1980). According to Blanchard (1990), the typical *N. tazetta* has flowers with white perianth segments and a dark yellow corona. Morphologically, *Narcissus tazetta* closely resembles *N. papyraceus*; however, it generally may be distinguished from *N. papyraceus* by its yellow to orange coronas that are clearly darker in color than the perianth segments (most *N. papyraceus* have the perianth and corona concolorous and pure white in color). Fresh specimens should be examined if corona color is used to distinguish the two species, as dried specimens are often difficult to distinguish (Straley & Utech

2002). The Clark County records of *N. tazetta* may be examples of some of the “*tazetta*” cultivars, such as ‘Grand Primo’ and ‘Early White’, which are, in fact, apparently interspecific hybrids of garden origin between *N. tazetta* and *N. papyraceus* (Howard 2001; see discussion under *N. papyraceus* for additional information). Fields, roadsides, and old home sites. Flowering February–April.

Voucher specimens. **Arkansas.** Clark Co.: Arkadelphia, Henderson State University campus, E side of parking area behind old Caddo building, a few clumps of plants growing on a disturbed, semi-unkept hillside, probably long-persistent from cultivation but not planted recently, several clumps of *Lycorus radiata* also present, 17 Feb 2009, *Serviss 7399* (HEND); Arkadelphia, North 19th Street, old home site, E side of property, probably persistent from cultivation, 12 Mar 2007, *Worth 37* (HEND).

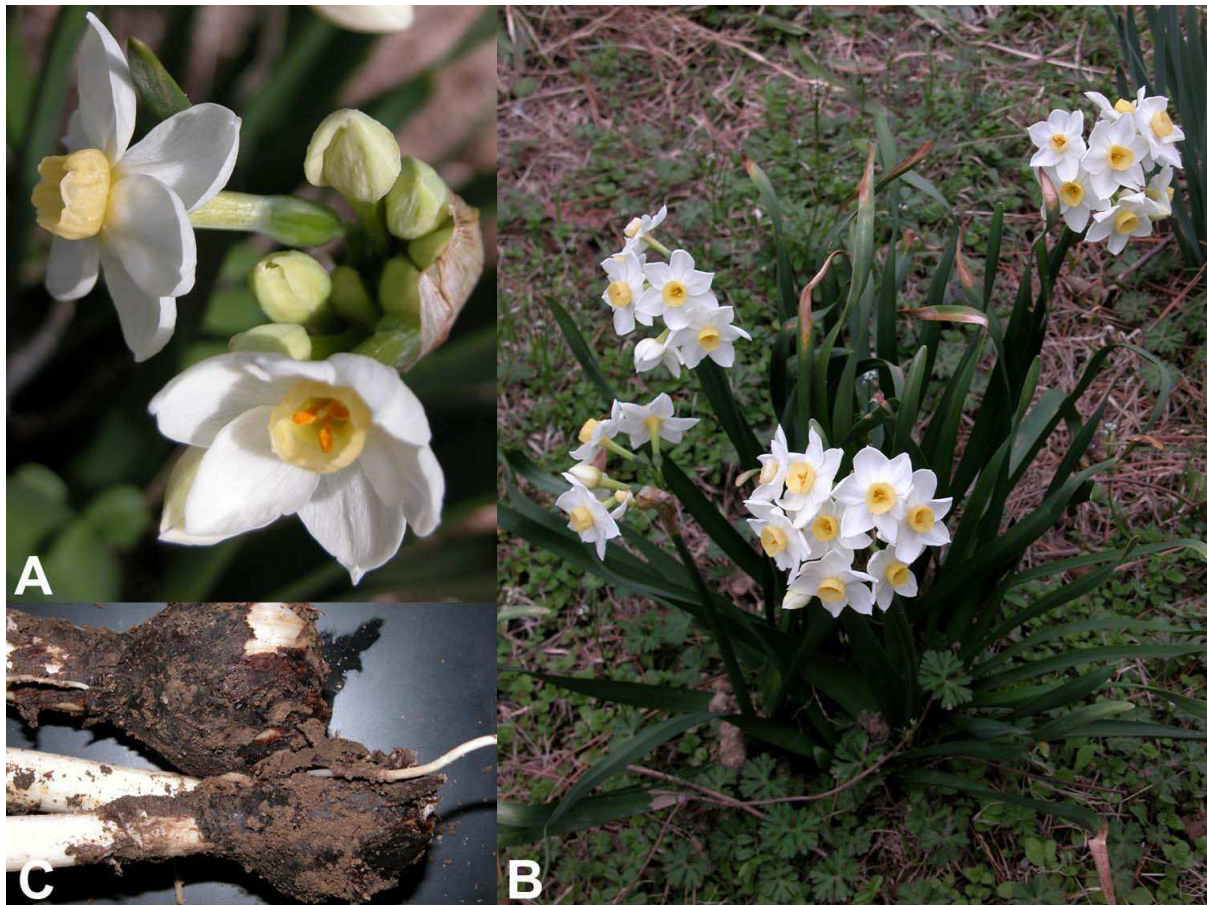


Figure 23. *Narcissus tazetta* cultivar (the plant shown here is probably one of the hybrid *tazetta* cultivars, such as ‘Grand Monarque’ or ‘Grand Primo’; some of these *tazetta* hybrids are large, robust plants that can be long-persistent subsequent to cultivation practices). (A) Flowers. (B) Plant and inflorescences. (C) Bulbs.

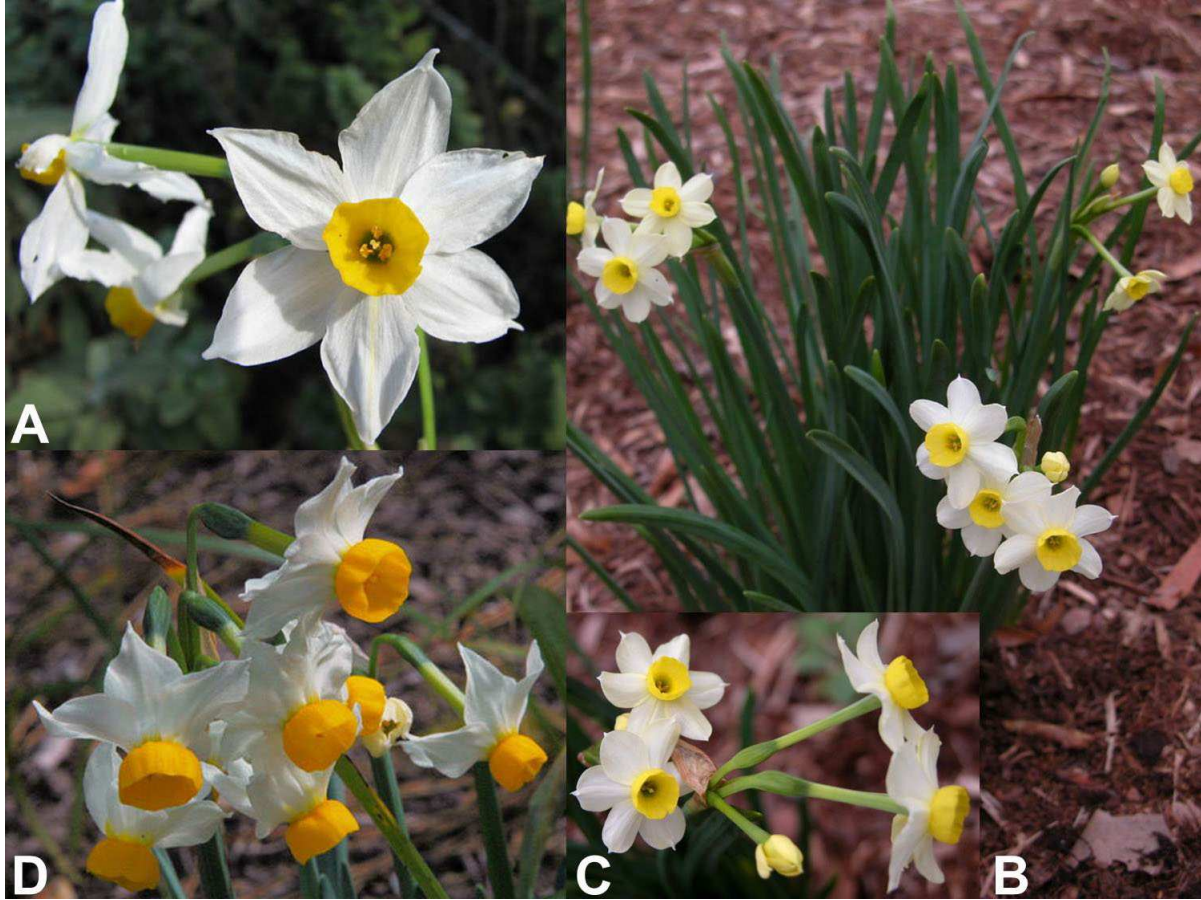


Figure 24. *Narcissus tazetta*. (A) Flowers (photo credit Nhu H. Nguyen). (B–C) Flowers and plants of an *N. tazetta* cultivar (the flowers of this cultivar are reminiscent of those of wild-type *N. tazetta* plants; however, wild forms of *N. tazetta* often have coronas that are darker yellow and perianth segments that are folded/curved inward at the margins, as shown in Figs. A & D). (D) Flowers and inflorescence—notice the dark yellow–orange coronas and yellow coloration at the base of the perianth segments (photo credit Mary Sue Ittner).

***Narcissus X tenuior* Curt. – SLENDER NARCISSUS (Fig. 25)**



Narcissus X tenuior is a sterile hybrid, presumably between *N. jonquilla* and *N. poeticus* that is probably of garden origin (Meyer 1966). *Narcissus X gracilis* Sab. is sometimes considered to be a similar, yet distinct, species from *N. X tenuior*. Meyer (1966) states that *N. X gracilis* is probably only a form of *N. X tenuior*, and should be considered synonymous with it; however, Blanchard (1990) made a distinction between the two taxa based on the smaller overall plant size, less robust habit, and fading of the perianth segments from yellow to nearly white or white as distinctly characteristic of *N. X tenuior*. *Narcissus X tenuior* is

rarely encountered persistent from cultivation and probably only sparingly naturalized in Arkansas. *Narcissus X tenuior* is morphologically somewhat similar to a few other *Narcissus* taxa more commonly encountered in the state, including *N. X medioluteus* and certain forms of *N. tazetta*. The flowers of *N. X tenuior* are unusual in that the perianth typically fades from yellow to almost white or white as the flowers age, resembling a diminutive form of *N. X medioluteus* at that stage. The leaves of *N. X tenuior* are linear and grass-like. *Narcissus X tenuior* has not been previously recorded from Arkansas. Fields, roadsides, and old home sites. Flowering March–April.

Voucher specimens. **Arkansas.** Clark Co.: Arkadelphia, N 34° 09.033 W 093° 03.8081, open field with scattered trees, single clump of plants, *Allium canadense* also present at site, 3 Apr 2002, *Slaughter 2* (HEND). Montgomery Co.: Hwy 270, about 1 mi W of Pencil Bluff, old home site and adjacent bluff and roadside, numerous plants, appeared to be well-naturalized, 5 Apr 2003, *Serviss 5128* (HEND).

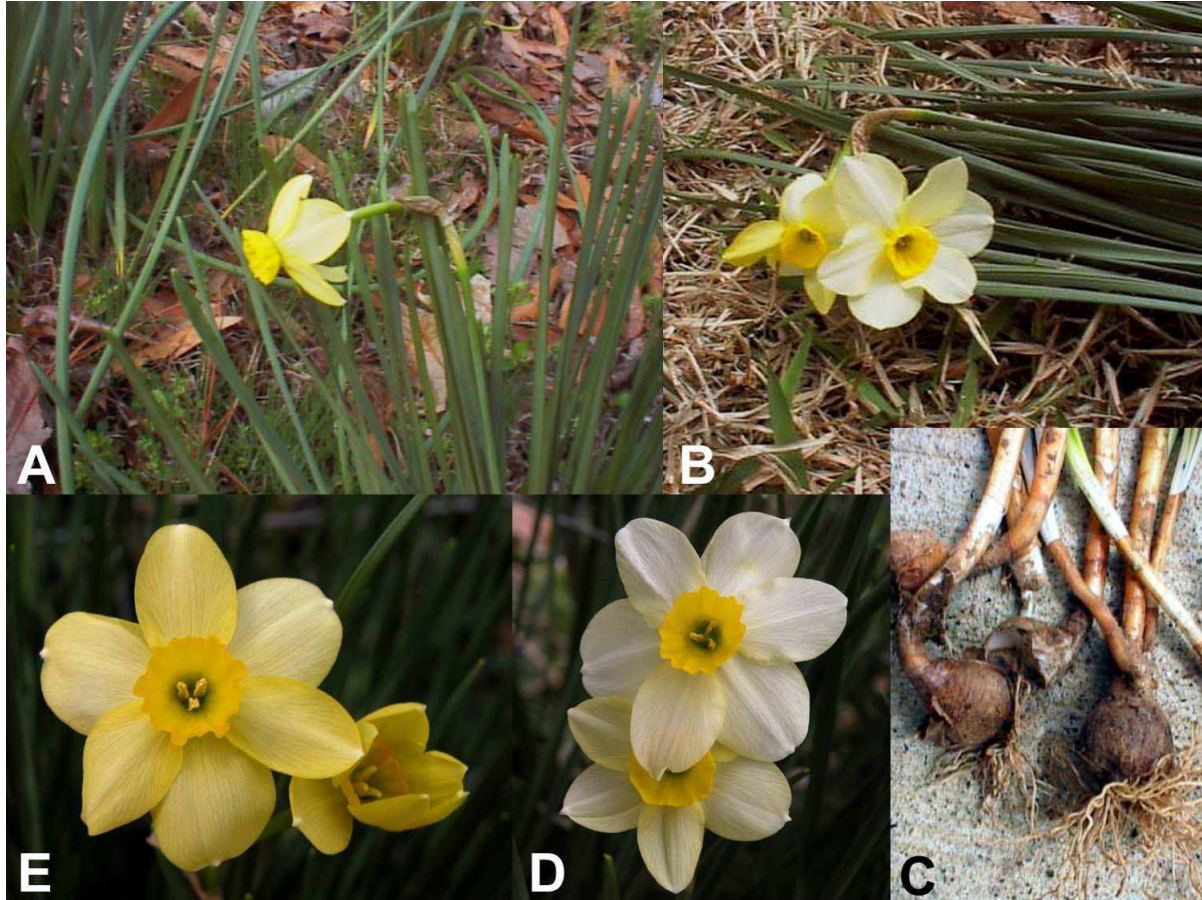


Figure 25. *Narcissus X tenuior*. (A–B) Flowers and leaves; the reflexed perianth segments shown in Fig. A are not atypical. (C) Bulbs and roots. (D–E) Flowers (the flowers in Fig. E are new, whereas those in Fig. D are older; notice how the perianth segments have faded from yellow to yellowish–white).

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