

# FIELD & LABORATORY

Volume XVI

January, 1948

Number 1

## The Bur Clovers (*Medicago*) of Texas

Fred H. Wagner

Originally all species of *Medicago* found in Texas were introduced and cultivated for grazing, soil improvement and erosion control. All species here treated are now found wild.

The keys are based on specimens in the University of Texas Herbarium and Southern Methodist University Herbarium; specimens in the Milwaukee Public Museum were also consulted for study. Grateful acknowledgment is made to Drs. F. A. Barkley and B. C. Tharp, of the University of Texas Herbarium, and to Mr. A. M. Fuller, Curator of Botany, Milwaukee Public Museum, for the loan of material of the genus.

### KEY TO TEXAS SPECIES OF MEDICAGO

- A. Plant perennial, with many strong erect stems from a single woody taproot. Legume a spineless, loosely coiled, corkscrew-shaped pod of not more than 2 turns, 3-4 mm. in diameter (fig. 1). Flowers generally blue or violet; corolla 6-9 mm. long.....1. *M. sativa*
- AA. Plant annual or winter annual, generally reclining, occasionally ascending, rarely erect. Flowers yellow; corolla less than 6 mm. long
- B. Stipules acuminate, slightly dentate (figs. 2, 3). Leaves, stems, stipules, and calyxes more or less pubescent
- C. Legume a spineless kidney-shaped pod 1-2 mm. long (fig. 2).....2. *M. lupulina*
- CC. Legume a spiny coiled pod 2-4 mm. in diameter. (exclusive of spines) (fig. 3).....3. *M. minima*
- BB. Stipules deeply divided (figs. 4, 6, 7). Plant essentially glabrous except for slight pubescence on stems
- D. Legume a rather loosely curled, barrel-shaped pod 4-6 mm. in diameter
- E. Stipules (at least those in the terminal half of the of the stem) deeply divided beyond the middle, in many cases almost to the base (fig. 4). Leaflets without a central spot. Pods with 2 or 3 rows of spines, generally arising from a raised ridge (figs. 4, 5), never with a furrow between the rows
- F. Pods with spines (fig. 4).....4a. *M. hispida*
- FF. Pods without spines, or with vestigial spines (fig. 5).....4b. *M. hispida* var. *apiculata*
- EE. Stipules divided no deeper than to the middle (fig. 6). Leaflets generally with a dark brown or purple spot in center. Pods with 2 rows of spines separated by a distinct furrow (fig. 6).....5. *M. arabica*
- DD. Legume a tightly coiled, spineless flattened pod 10-15 mm. in diameter (fig. 7).....6. *M. orbicularis*

## KEY BASED ON VEGETATIVE AND FLORAL CHARACTERS

- A. Plant perennial, with many strong erect stems from a single woody taproot. Leaflets linear-oblong, generally 3 times or more as long as wide. Flowers 6-9 mm. long, blue or violet.....1. *M. sativa*
- AA. Plant annual or winter annual, generally reclining, occasionally ascending, rarely erect (when erect, stems are few and weak). Leaflets less than 3 times as long as wide. Corolla less than 6 mm. long, yellow
- B. Stipules slightly dentate to divide but not beyond the middle
- C. Stipules slightly dentate (figs. 2, 3). Leaflets without a central spot. Plant moderately to considerably pubescent throughout.....2. *M. lupulina* and 3. *M. minima*
- CC. Stipules deeply divided, almost to the middle (fig. 6). Plant glabrous except for slight pubescence on stems.....5. *M. arabica*
- BB. Stipules (at least those in the terminal part of the stem) divided beyond the middle (figs. 4, 7)
- D. Leaflets almost as wide as long, the tip emarginate; or leaflets longer and more slender, but the tips almost invariably rounded. Pedicels as long as the calyx lobes or longer (fig. 7).....6. *M. orbicularis*
- DD. Leaflets considerably longer than wide, almost all with emarginate tips (fig. 4). Pedicels shorter than the calyx lobes, some flowers almost sessile.....
- 4a. *M. hispida* and  
4b. *M. hispida* var. *apiculata*

## KEY BASED ON MATURE FRUITS

- A. Pods spineless or with only vestigial spines
- B. Legume a dark brown or black kidney-shaped pod (not coiled) 1-2 mm. long (fig. 2).....2. *M. lupulina*
- BB. Legume coiled, 3-15 mm. in diameter
- C. Legumes 3-6 mm. in diameter
- D. Legume a loosely coiled, somewhat corkscrew-shaped pod 3-4 mm. in diameter (fig. 1).....1. *M. sativa*
- DD. Legume a more tightly coiled pod of 2-4 coils, 4-6 mm. in diameter (fig. 5).....4b. *M. hispida* var. *apiculata*
- CC. Legume 10-15 mm. in diameter, flattened and tightly coiled (fig. 7).....6. *M. orbicularis*
- AA. Pods conspicuously spiny
- E. Pods with 2 or 3 rows of spines arising from a raised ridge, never with a furrow between the rows of spines (fig. 3, 4); spines usually hooked
- F. Burs 2-4 mm. in diameter, with hairs between the spines.....3. *M. minima*
- FF. Burs 4-6 mm. in diameter, glabrous.....4. *M. hispida*
- EE. Pods with 2 rows of spines separated by a conspicuous furrow (fig. 6); spines infrequently hooked.....5. *M. arabica*

1. *M. SATIVA* L. Alfalfa is easily distinguished from other species of *Medicago* by its perennial, erect habit of growth, its elongated leaflets, large violet or blue flowers, and loosely coiled, spineless pods (fig. 1). From the array of counties in which it has been collected, it appears to be our most widely distributed species. This of course is because it is so widely cultivated. The list of counties from which specimens have been seen does not indicate its distribution as a wild plant,

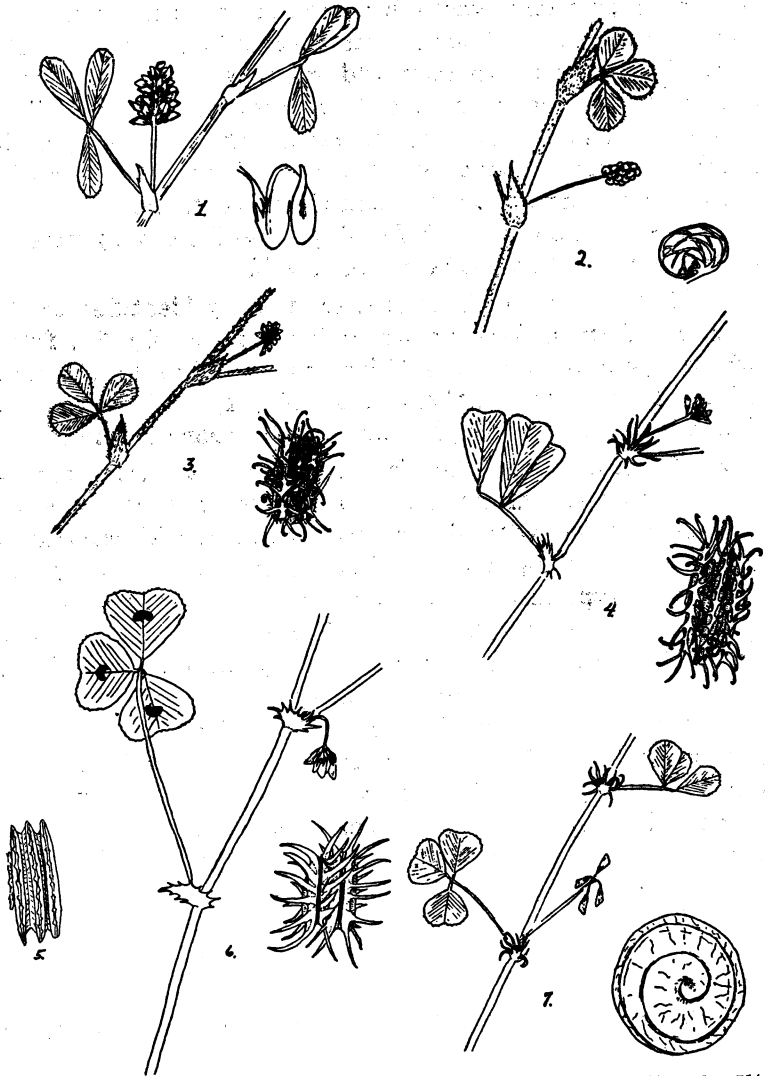
but more probably where it is found in cultivation. The earliest collection is from Austin, Travis Co., July 17, 1915. It has been found (whether wild or cultivated is not always stated on the specimen labels) in Brewster, Cass, Collin, Culberson, Dallas, Denison, Eastland, Erath, Grayson, Hudspeth, Lipscomb, Lubbock, Navarro, Nolan, Pecos, Rockwall, Rusk, Tarrant, Travis, and Upton counties.

The yellow-flowered alfalfa, *M. falcata* L., is very rare in cultivation and has not been found wild.

2. *M. LUPULINA* L. This species is easily identified by its clusters of small dark brown or black pods (fig. 2), from which it derives its name "black medic." The first record of it in Texas is from Galveston Co., May 1, 1937. It has been found in Dallas, Denton, Fannin, and Johnson counties.

3. *M. MINIMA* (L.) Grufberg. This has a fairly characteristic gray appearance due to its pubescence. It can however be confused with *M. lupulina*, which like *M. minima* is found with varying degrees of pubescence and varying leaf shapes. *M. lupulina* frequently has more flowers per cluster (8-18 as compared with 5-10 in *M. minima*), but this is not invariably true. The spineless kidney-shaped pod of *M. lupulina* is its only positive distinguishing character. The pod of *M. minima* resembles that of *M. hispida* except that it is smaller, and the spines are interspersed with hairs. The earliest collection of *M. minima* is from Spicewood Springs, Burnet Co., April 11, 1914. This species is the one most commonly seen around Dallas, and through the Blackland Prairie region of central Texas. It has been collected in Burnet, Dallas, Denton, Ellis, Gillespie, Hays, Johnson, Kerr, Kimble, Llano, Mitchell, Tarrant, Taylor, and Travis counties.

4. *M. HISPIDA* Gaertn. This is cultivated under the name "California bur clover." It is frequently confused with *M. arabica*, but can be definitely distinguished from it by the lack of a furrow between the rows of spines on the pod (fig. 4). It has a fairly characteristic leaflet shape, more elongated than that of *M. arabica*. The very deeply divided stipules also are a fairly constant distinguishing character. *M. hispida* was first collected at Austin, Travis Co., March 30, 1900. It appears to be the most widely distributed bur clover in the wild, though the herbarium specimens rather



1. *M. sativa*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 3\frac{1}{2}$ . 2. *M. lupulina*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 7\frac{1}{2}$ .  
 3. *M. minima*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 4$ . 4. *M. hispida*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 3\frac{1}{2}$ .  
 5. *M. hispida* var. *apiculata*. Pod  $\times 4$ . 6. *M. arabica*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 2\frac{1}{2}$ .  
 7. *M. orbicularis*. Leafy shoot  $\times \frac{1}{2}$ , pod  $\times 1\frac{1}{2}$ .

than giving a complete and accurate record of its distribution, merely indicate where it happens to have been collected. It has been found in Bosque, Brazos, Calhoun, Denton, Erath, Galveston, Goliad, Hamilton, Hays, Henderson, Lee, Navarro, Presidio, Somervell, Tarrant, Travis, and Victoria counties.

4b. *M. HISPIDA* var. *APICULATA* (Willd.) Burnat. This variety is essentially identical vegetatively with *M. hispida*, but the absence of spines on the pod (fig. 5) is a constant feature. A plant similar to this variety is cultivated at the State Agricultural Experiment Station at Denton under the name of *M. sardoa*. Vegetatively it appears to be identical with *M. hispida* var. *apiculata*, and the pod differs only in having 1 or 2 more coils (total 4-7). It has not been found wild, and is not included in the key. The first Texas record of the spineless variety of *M. hispida* is from Kingsville, Kleberg Co., spring of 1940 (cultivated). It has also been found in Denton Co. (cultivated).

5. *M. ARABICA* (L.) All. This is frequently confused with *M. hispida*, but the furrow between the rows of spines on the pod (fig. 6) is an invariable distinguishing feature. The comparatively shallowly divided stipules and shorter, broader leaflets give it a fairly characteristic appearance. The central spot of the leaflets is almost invariably present, and give the species the common name "spotted bur clover." Another fairly constant feature is the shortness of the stalk of the terminal leaflet, making the leaves appear almost palmately compound. *M. arabica* was first collected in Texas at Austin, Travis Co., Dec. 27, 1913. It is the least common species of bur clover found wild in Texas; it has been collected in Brazos, Henderson, Jasper, and Travis counties.

6. *M. ORBICULARIS* (L.) All. The large flat pods of this species (fig. 7) are the most obvious character to distinguish it, and give it the common name "button clover." Vegetatively it is similar to *M. hispida*, but the proportionately broader leaflets and longer pedicel allow fairly certain identification in the absence of pods. This species was first collected at Austin, Travis Co., May, 1915. It is becoming common in north central Texas, and has been collected in Dallas, Denton, and Travis counties.