

DODDER

CUSCUTA SPP.

CUSCUTACEAE



On the Class 1 Prohibited Noxious Weed Seeds right now, there is currently Dodder, *Cuscuta spp.* Very simple if you find Dodder, *Cuscuta spp.* you report it as prohibited noxious on your report of analysis.

On the proposed Weed Seeds Order Review dated July 2014 hand out, there is the following under Proposed Class 1 Prohibited Noxious Weed Seeds: (*Keep in mind it is only a proposal.*)

Dodder EXCEPT

	<u>Common Name</u>	<u>Also known as</u>
<i>Cuscuta cephalanthi</i>	Dodder, Buttonbush	
<i>Cuscuta coryli</i>	Dodder, Hazel	
<i>Cuscuta gronovii</i> (Pic)	Dodder, Swamp	<i>C. gronovii</i> var <i>curta</i> or <i>C. umbrosa</i>
<i>Cuscuta umbrosa</i>	Dodder, Large Fruited	<i>C. gronovii</i> var <i>curta</i> or <i>C. megalocarpa</i>
<i>Cuscuta pentagona</i> (Pic)	Dodder, Five Angle	<i>C. arvensis</i> or <i>C. arvensis</i> var <i>pentagona</i>
<i>Cuscuta polygonorum</i>	Dodder, Smartweed	
<i>Cuscuta salina</i>	Dodder, Salt Marsh	

As Canada is a signatory to the IPPC guidelines and technically, you can not prohibit import of something that is widespread in your country. The *Cuscuta* excepted species listed above are all present in Canada.

In order to promote more knowledge among seed analysts on *Cuscuta spp.* Dodder, the following report has been done on this problematic plant in North America. The genus comprises about 170 species in total worldwide. Some dodder are specific to a few hosts, while some parasitize many species.

Dodder reproduces readily from seed. A single plant may produce thousands of seeds, which can remain viable in the soil for up to 20 years. *Cuscuta* are usually annual parasites lacking chlorophyll. Dodder has no leaves and only has roots as it begins life. Seeds sprout from the ground in spring like any other plant. It immediately has to find a host plant to latch on to. If it does not attach itself to a host in ten days, it dies.

Once it finds a host, Dodder twines itself in a counter-clockwise direction tightly around the stem of the plant. Dodder will then lose its connection to the ground and be totally dependent on its host. Dodder survives by little bumps on its stem that it presses into its host's stem and pulls out nutrients that it needs to survive.

Dodder has tiny (white, pink, yellow or cream coloured) bell-shaped flowers that bloom from June to October depending upon the species. A tiny fruit appears after the flower is gone that contains one to four seeds. The skin of the fruit is paper thin that breaks easily sending the seeds to the ground to wait out the winter and sprout in the spring.

The *Cuscuta* fruit matures at the same time as the host fruit, so the two are harvested together. *Cuscuta* seed contamination of crop seeds is very common, and is the major means of spread. Separation is difficult when *Cuscuta* seeds are the same size and shape as host seeds such as those of legumes.

There are many types of *Cuscuta* species and the plants are often difficult to tell apart even after flowering. Common nick names include Witches' Shoelaces, Hairweed, Devil's-guts and Love Vine. Dodder looks like yellow/orange spaghetti that has been thrown all over a plant. The *Cuscuta* species are often interlinked with many synonyms and common names repeated for different species. See an image above of the plant.

Cuscuta's habitat is as a weed of cultivated and perennial crops, pastures, ditch banks, roadsides. Dodder is a major economic problem for such crops as alfalfa, clover and flax. Dodder can also carry plant diseases or viruses, including *Phytoplasma*, which is responsible for many of the "yellow" diseases. *Cuscuta* may be immune to the plant disease or virus; but will pass along to another host plant it encounters.

Dodder species used for medicinal herbs are, *Cuscuta epithimum*, *C. Americana*, *C. chinensis*, *C. europaea*, *C. japonica*, *C. megalocarpa* and *C. reflexa*.

One good point for *Cuscuta japonica* is that it grows on Kudzu and can be used for weed control. Dodder has also been identified as an important food plant for the Brown Elfin Butterfly.

American Dodder (*Cuscuta americana*) and Golden Dodder (*Cuscuta campestris*) are particularly damaging agricultural weeds.

It is very difficult to eradicate once it becomes established in an area. Any herbicides that could kill it will also kill the host plant it is growing on.

Fruit is a round, 2-loculed capsule containing up to 4 seeds. Seeds are variously shaped: round, ovate or obovate, to oblong in outline, and globose, subglobose, ovoid, or angular in three dimensions. The seeds may be flat or depressed on 1 or 2 sides; from 0.5–5 mm long, with most 1–2 mm long. They range from variously colored; light gray, yellowish, or reddish, to dark brown. Surface ranges from finely to coarsely rough, granular, rugose, pitted, reticulate or scurfy. Scar area can be small, distinct, in the middle of which the hilum appears as a raised line, point or slit.

For identification purposes of seeds, seed characteristics that can help distinguish between species are size, shape, color, seed coat texture, and morphology of hilar area (size, color and hilum type).

The seeds are so similar in so many of the species; this becomes a true challenge to any seed analyst. What makes it even harder is that not much research has been done or identification materials been developed on the differences of all the *Cuscuta* spp. One reason is that in both Canada and the USA when found as contaminant in a seed sample, it has been called Dodder, *Cuscuta* spp. with no need to separate species.

If the proposed changes to the Weed Seed Order go forward, how will a seed analyst have to report on their report of analysis if they do find Dodder *Cuscuta* spp.? Further study has to be done on that aspect.

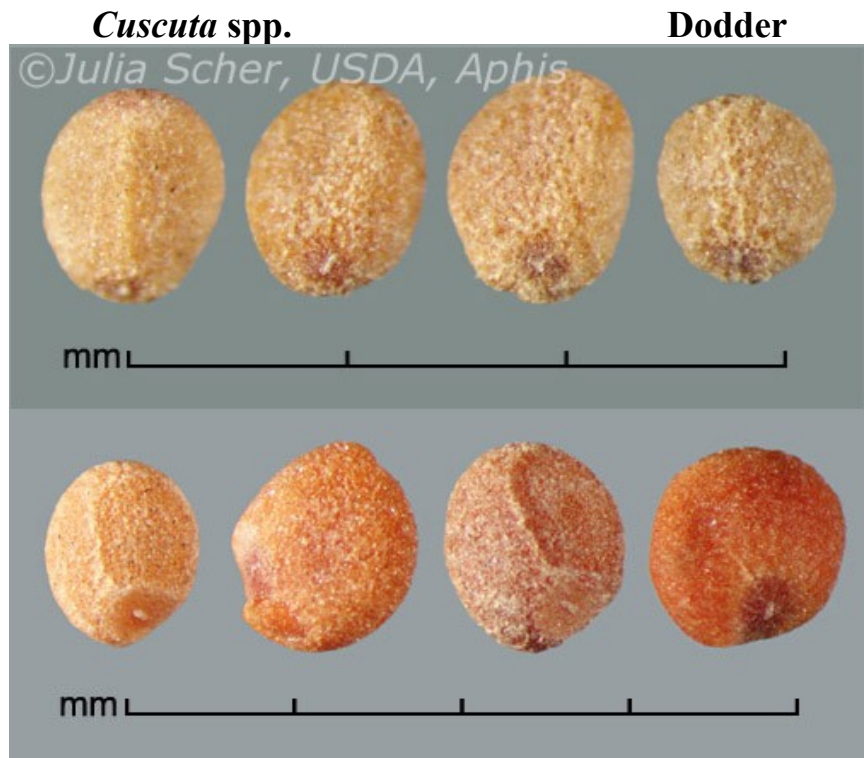
Example of reporting:

Prohibited Noxious

1 - Dodder *Cuscuta* spp. Except *Cuscuta cephalanthi*, *Cuscuta coryli*, *Cuscuta gronovii*, *Cuscuta umbrosa*, *Cuscuta pentagona*, *Cuscuta polygonorum* and *Cuscuta salina*

Or just as before.

1 – Dodder *Cuscuta* spp.



SEED IMAGES OF VARIOUS *CUSCUTA* SPP. DODDER

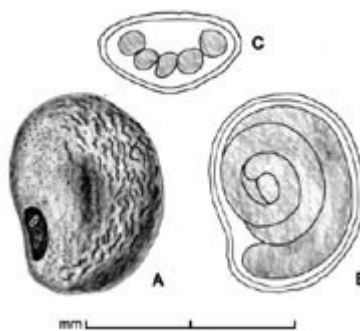
Cuscuta approximata

Small Seed Alfalfa Dodder



Cuscuta australis

Australian (Chinese) Dodder



Cuscuta australis. A, Seed; B, longitudinal section of seed showing embryo; C, transection of seed drawing by Lynda E. Chandler

Cuscuta australis **Australian Dodder Plant**
* picture done by Ken Allison



Cuscuta campestris

Common Dodder



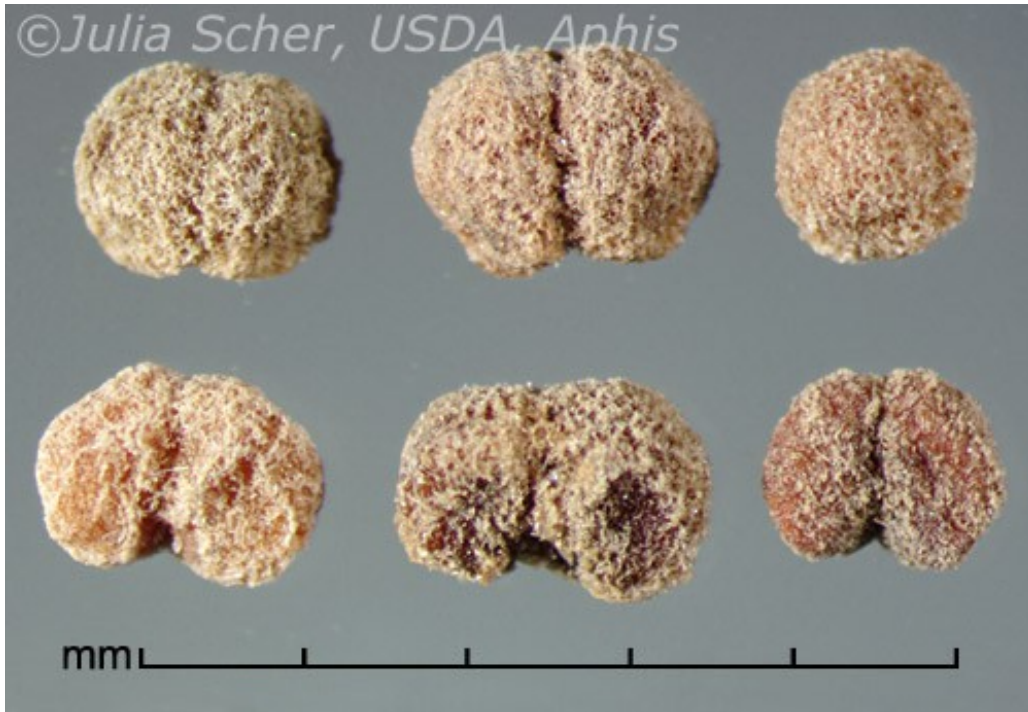
Cuscuta cinensis

Chinese Dodder



Cuscuta epilinum

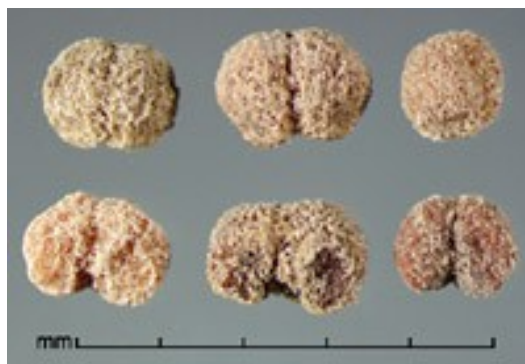
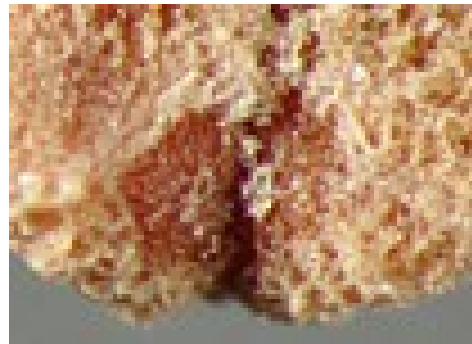
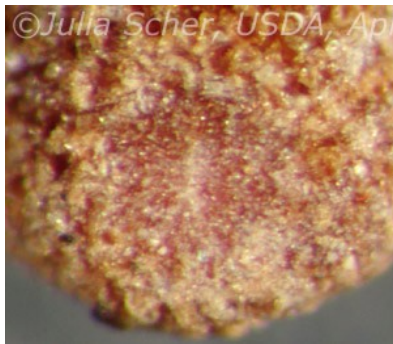
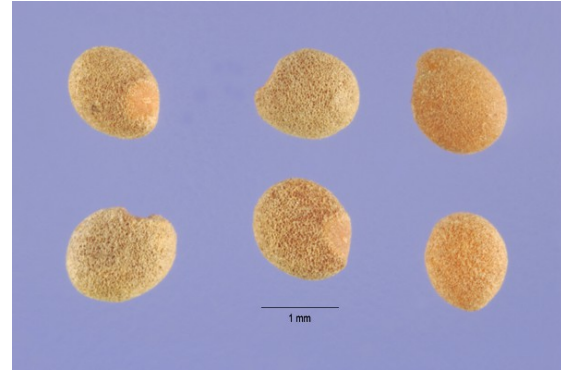
Flax Dodder



Cuscuta epithymum



Clover Dodder



Cuscuta gronovii

Swamp Dodder

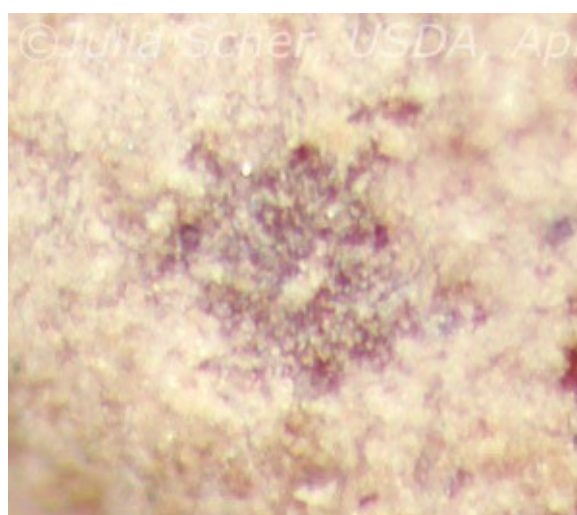


©Julia Scher, USDA, Aphis



Cuscuta hyalina

Hyalina Dodder



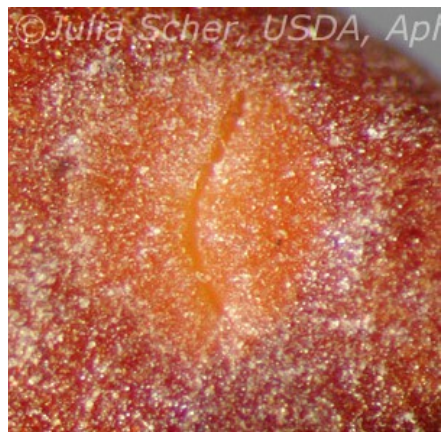
Cuscuta indecora

Big Seed Alfalfa (Large Seed) Dodder

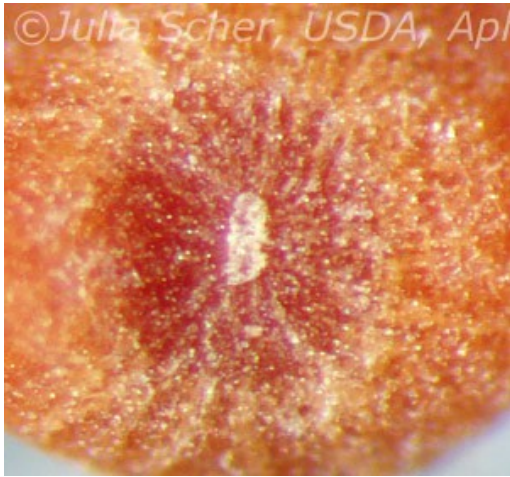


Cuscuta japonica

Japanese Dodder



Cuscuta pentagona Field Dodder



©Julia Scher, USDA, Aphis



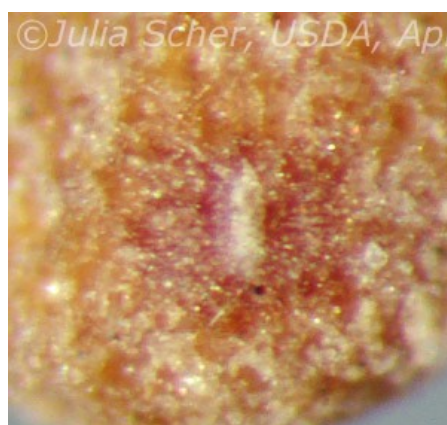
Cuscuta pentagona var. *pubescens*

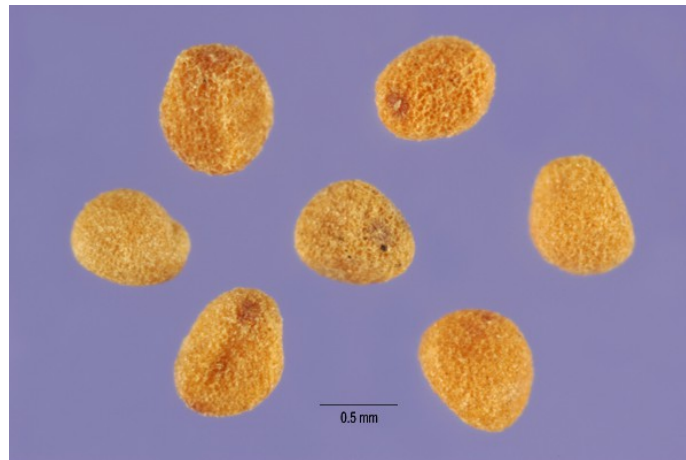
Bush Clover Dodder



Cuscuta planiflora

Little Seed Alfalfa (Small Seed) Dodder





Other species of the Dodder family: (no pictures available)

- | | |
|-----------------------------|----------------------------|
| <i>Cuscuta attenuata</i> | Tap city dodder |
| <i>Cuscuta ceanothii</i> | Canyon dodder |
| <i>Cuscuta cephalanthii</i> | Buttonbush dodder |
| <i>Cuscuta cuspidate</i> | Cusp dodder |
| <i>Cuscuta denticulate</i> | Desert dodder |
| <i>Cuscuta exaltata</i> | Tall dodder |
| <i>Cuscuta fasciculate</i> | Clustered dodder |
| <i>Cuscuta glabrior</i> | Bush clover dodder |
| <i>Cuscuta mitriformis</i> | Cochise dodder |
| <i>Cuscuta nevadensis</i> | Desert dodder |
| <i>Cuscuta obtusifolia</i> | Santa Rita mountain dodder |
| <i>Cuscuta occidentalis</i> | California dodder |
| <i>Cuscuta plattensis</i> | Prairie dodder |
| <i>Cuscuta rostrata</i> | Beaked dodder |
| <i>Cuscuta runyonii</i> | Runyon's dodder |
| <i>Cuscuta sanwichiana</i> | Kauna'oa dodder |
| <i>Cuscuta squamata</i> | Scale flower dodder |
| <i>Cuscuta suaveolens</i> | Chilean (fringed) dodder |
| <i>Cuscuta suksdorfii</i> | Mountain dodder |
| <i>Cuscuta tasminca</i> | Tasmanian dodder |
| <i>Cuscuta vetchii</i> | Veatch's dodder |
| <i>Cuscuta warneri</i> | Warner's dodder |

Appendix A -

91 CUSCUTA SPP. REFERENCED IN GRIN

1. *Cuscuta acuta* Engelm.
2. *Cuscuta alata* Brandegee
3. *Cuscuta americana* L.
4. *Cuscuta applanata* Engelm. (= *Cuscuta chinensis* var. *applanata* (Engelm.) Costea & Stefanovic)
5. *Cuscuta approximata* Bab.
6. *Cuscuta aristeguietae* Yunck. (= *Cuscuta colombiana* Yunck.)
7. *Cuscuta arvensis* Beyr. ex Engelm. (= *Cuscuta pentagona* Engelm.)
8. *Cuscuta arvensis* var. *pentagona* (Engelm.) Engelm. (= *Cuscuta pentagona* var. *pentagona*)
9. *Cuscuta australis* R. Br.
10. *Cuscuta azteca* Costea & Stefanovic
11. *Cuscuta boldinghii* Urb.
12. *Cuscuta bonafortunae* Costea & I. Garcia
13. *Cuscuta brachycalyx* (Yunck.) Yunck.
14. *Cuscuta californica* var. *brachycalyx* Yunck. (= *Cuscuta brachycalyx* (Yunck.) Yunck.)
15. *Cuscuta californica* Hook. & Arn.
16. *Cuscuta campestris* Yunck.
17. *Cuscuta carnosae* Costea & Stefanovic
18. *Cuscuta cassytoides* Nees ex Engelm.
19. *Cuscuta chapalana* Yunck.
20. *Cuscuta chilensis* Ker Gawl.
21. *Cuscuta chinensis* Lam.
22. *Cuscuta chinensis* var. *applanata* (Engelm.) Costea & Stefanovic
23. *Cuscuta chinensis* var. *chinensis*
24. *Cuscuta choisiana* Yunck.
25. *Cuscuta colombiana* Yunck.
26. *Cuscuta compacta* Juss. ex Choisy
27. *Cuscuta coryli* Engelm.
28. *Cuscuta corymbosa* Ruiz & Pav.
29. *Cuscuta corymbosa* var. *corymbosa*
30. *Cuscuta corymbosa* var. *grandiflora* Engelm.
31. *Cuscuta corymbosa* var. *stylosa* (Choisy) Engelm.
32. *Cuscuta costaricensis* Yunck.
33. *Cuscuta cotijana* Costea & I. Garcia
34. *Cuscuta decipiens* Yunck.
35. *Cuscuta deltoidea* Yunck.
36. *Cuscuta deltoidea* var. *serruloba* Yunck. (= *Cuscuta deltoidea* Yunck.)
37. *Cuscuta dentatasquamata* Yunck.
38. *Cuscuta desmouliniana* Yunck.
39. *Cuscuta draconella* Costea & Stefanovic
40. *Cuscuta epilinum* Weihe
41. *Cuscuta epithimum* (L.) L.
42. *Cuscuta erosa* Yunck.
43. *Cuscuta europaea* L.
44. *Cuscuta europaea* var. *epithimum* L. (= *Cuscuta epithimum* (L.) L.)
45. *Cuscuta gracillima* Engelm.
46. *Cuscuta gracillima* var. *esquamata* Yunck. (= *Cuscuta vandevenderi* Costea & Stefanovic)
47. *Cuscuta gracillima* var. *saccharata* Engelm. (= *Cuscuta sidarum* Liebm.)
48. *Cuscuta gracillima* var. *subtilis* Yunck.
49. *Cuscuta gronovii* Willd.

50. *Cuscuta gronovii* var. *curta* Engelm. (= *Cuscuta umbrosa* Beyr. ex Hook.)
51. *Cuscuta hyalina* Roth
52. *Cuscuta indecora* Choisy
53. *Cuscuta japonica* Choisy
54. *Cuscuta jepsonii* Yunck.
55. *Cuscuta lacerata* Yunck.
56. *Cuscuta legitima* Costea & Stefanovic
57. *Cuscuta leptantha* Engelm.
58. *Cuscuta liliputana* Costea & Stefanovic
59. *Cuscuta lupuliformis* Krock.
60. *Cuscuta macrocephala* W. Schaffn. ex Yunck.
61. *Cuscuta macvaughii* Yunck.
62. *Cuscuta megalocarpa* Rydb. (= *Cuscuta umbrosa* Beyr. ex Hook.)
63. *Cuscuta membranacea* Yunck.
64. *Cuscuta mesatlantica* Dobignard
65. *Cuscuta mexicana* Yunck.
66. *Cuscuta monogyna* Vahl
67. *Cuscuta myricoides* (L.) Druce
68. *Cuscuta odontolepis* Engelm.
69. *Cuscuta ortegana* Yunck.
70. *Cuscuta pacifica* Costea & M. A. R. Wright
71. *Cuscuta pentagona* Engelm.
72. *Cuscuta pentagona* var. *pentagona*
73. *Cuscuta planiflora* Ten.
74. *Cuscuta polyanthemos* W. Schaffn. ex Yunck.
75. *Cuscuta potosina* W. Schaffn. ex Engelm.
76. *Cuscuta punana* Costea & Stefanovic
77. *Cuscuta racemosa* var. *chiliana* Engelm. (= *Cuscuta suaveolens* Ser.)
78. *Cuscuta reflexa* Roxb.
79. *Cuscuta saccharata* (Engelm.) Yunck. (= *Cuscuta sidarum* Liebm.)
80. *Cuscuta salina* Engelm.
81. *Cuscuta serruloba* (Yunck.) Yunck. (= *Cuscuta deltoidea* Yunck.)
82. *Cuscuta sidarum* Liebm.
83. *Cuscuta* spp.
84. *Cuscuta strobilacea* Liebm.
85. *Cuscuta stylosa* Choisy (= *Cuscuta corymbosa* var. *stylosa* (Choisy) Engelm.)
86. *Cuscuta suaveolens* Ser.
87. *Cuscuta tinctoria* Mart. ex Engelm.
88. *Cuscuta tuberculata* Brandege
89. *Cuscuta umbellata* Kunth
90. *Cuscuta umbrosa* Beyr. ex Hook.
91. *Cuscuta vandevenderi* Costea & Stefanovic
92. *Cuscuta yucatana* Yunck.

Botanists recognize over 170 *Cuscuta* species of Dodder worldwide.