Western Catalpa, *Catalpa speciosa*, Colonising in Toronto, Ontario

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Churcher, C. S. 1992. Western Catalpa, *Catalpa speciosa*, colonising in Toronto, Ontario. Canadian Field-Naturalist 106(3): 390–392.

Three young specimens of *Catalpa speciosa* or Western Catalpa are present in the North Rosedale Ravine and Don Valley Brickyard pit. They are between 6 and 8 years old, presumably result from fertile self-seeding from ornamental plantings in Rosedale, and one flowered in June, 1991. This appears to be the first record of this species escaping from plantings in the Toronto area.

Key Words: *Catalpa speciosa*, Western Catalpa, Toronto, colonising.

The North American catalpas (*Catalpa speciosa* and *C. bignonioides*) are probably not native to Ontario (Bonner and Graney 1989), and certainly not to the Toronto Region. Both Western (*C. speciosa*) and Eastern (*C. bignonioides*) catalpas have been planted in southern Ontario along the north shore of Lake Erie and in towns in the better climatic areas. Cruise (1969), Dodge (1914, 1915) and Scoggan (1979) report *C. speciosa* persisting in Essex County (Dodge 1914; Morton and Venn 1990). The occurrence of colonising individuals in Toronto is noteworthy and represents a significant extension of suitable habitat and seeding success, although it may be an isolated instance and reflect the "city effect". Elsewhere, over most of Ontario, catalpas fail to produce viable seed and exist as planted ornamentals only.

Observations

The Western Catalpa (*Catalpa speciosa*) is present as three self-seeded individuals in the Rosedale area of Toronto. Both the Western and Eastern or Common Catalpa (*C. bignonioides*) are present as plantings in North Rosedale, e.g., a Western in Chorley Park and an Eastern at 173 Glen Road just south of Summerhill Avenue. Thus a readily available seed source for both species is available in the area.

Don Valley Brickyard Specimens

Two young individuals are located on the edge of a shale slope by an old road on the eastern wall of the Don Valley Brickyard, about 100 m north of Chorley Park and to the east of a stream and the old Beltline right-of-way (Figure 1). The larger individual was about 7-8 years old from counted nodes, about 4 m high, and growing well in 1991. The smaller is about 10 m south of the larger, about 6-7 years old, but only about 1.5 m high.

The larger individual has nodes between 300 and 400 mm long, average = 356 mm, and leaves up to 300 mm long and 230 mm wide, including the acuminate tip. The shape of the leaves agrees best with those of *C. speciosa*. In shape they are tapered acuminate-ovate or acuminate-cordate, with a prominent tapered acuminate tip (Scoggan 1979). The undersides are pubescent. There are no signs of lateral points to the leaves. Comparison with the Glen Road *C. bignonioides* and the Chorley Park *C. speciosa* show that the former usually has sloping or rounded shoulders to the leaf near the petiole while the latter has shoulders that project above the junction of the petiole and blade. Both have pubescent undersurfaces to the leaves, but the latter is distinctly more so and the hairs appear longer, especially over the petiole. The tips of the leaves are more pointed and tapered in *C. speciosa* (Scoggan 1979). The larger leaves of the larger Brickyard specimen reach over 300 mm in length along the main midrib, with maximum widths greater than 200 mm, for a mean value of Length:Breadth ratios of 1.28 (N = 25; B:L = 0.786).

The leaves of the Glen Road *C. bignonioides* reach 270 mm in length along the main rib, with maximum widths usually across the secondary points about 240 mm, with one exceptionally broad at 288 mm. The mean value of the Length: Breadth ratio was 1.278 (N=25; B:L = 0.783). Thus the shapes of the leaves fall within a rectangle 1.28 long by 1.00 broad in both species, but the additional points and their less acuminate points make the leaves of *C. bignonioides* appear blunter or fuller than those of *C. speciosa.*

The first flowering of the larger individual was noted in June, 1991, in concert with that of the planted *C. speciosa* in the southeast of Chorley Park. Its flowers are white, with two yellow ventral stripes, and rows of purple-brown spots between the stripes and flanking them, on the lower three lobes. The spread corolla wings measure 45-55 mm, and there is a distinct notch on the ventral lip in the midline. These characters agree with Scoggan's (1979) description.

The smaller individual has leaves that are also strongly acuminate and pubescent underneath, but many of its leaves show the secondary points at the

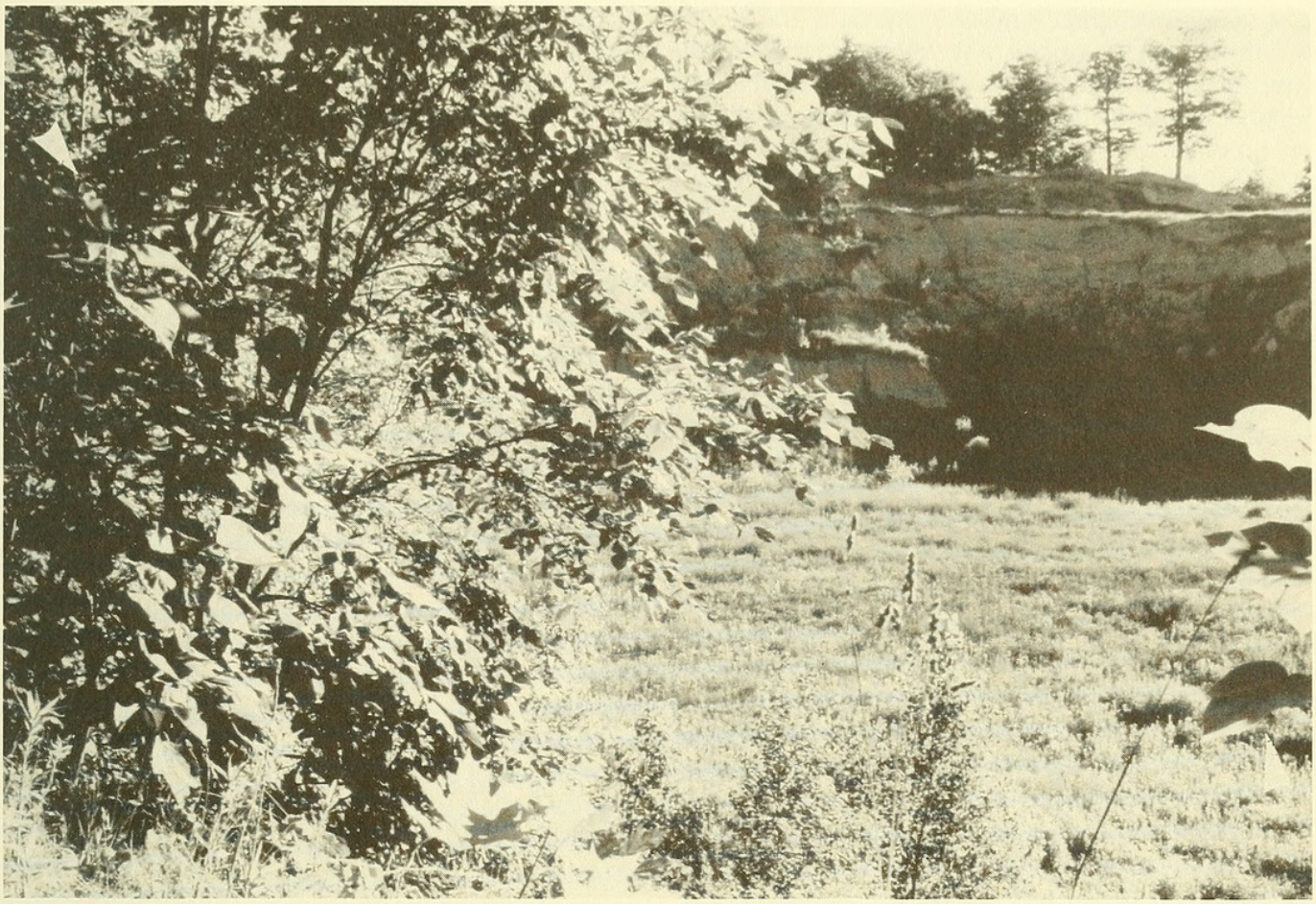

FIGURE 1. Young Western Catalpa (*Catalpa speciosa*) growing in the Don Valley Brickyard, Toronto, June, 1991. Note flowers (arrow) on left hand specimen and three-pointed leaves on right hand specimen. The Don Valley Formation type section is visible in the background.

ends of the two main secondary veins. The leaves are smaller and, as it is shaded and small, have not been measured. The Eastern Catalpa on Glen Road has many three-pointed leaves and this smaller individual may represent that species. Confirmation will have to await its flowering for floral characters and timing.

North Rosedale Ravine Specimen

The third individual is on the north side of the North Rosedale Ravine, about 50 m east of the Glen Road Bridge, growing in a damp habitat among ash (*Fraxinus americana*), Sugar Maple (*Acer saccharum*) and Manitoba Maple (*A. negundo*). It was about 6-7 years old on the node count in 1991, with increments from 280 to 840 mm long, mean = 560 mm. No flowers were present in 1991.

The larger leaves of the Ravine specimen vary up to 358 mm long over the midrib and tip by 310 mm wide, for a mean value of the Length:Breadth ratios of 1.309 (N = 26; B:L = 0.764). There are no accessory points to these leaves at the ends of the main secondary veins, although convex bulges occur on about 50% of the leaves at these points. A distinct edge in which the main secondary veins form the proximal margin of the leaf for 10-15 mm before a chordate lobe encloses the vein and forms a rounded convex shoulder occurs in about 30% of the leaves.

Discussion

In these characters these young trees agree with those for *C. speciosa* in that blooming is earlier by two weeks than in *C. bignonoides*, in their longer and more tapered leaves (Symonds and Chelminski 1958). However, no distinction on the smell from the crushed leaves could be verified. Further agreement is present in the pubescent undersurface of the leaves, in the broad corolla wings, and in the inconspicuously spotted and notched tube (Scoggan 1979).

C. speciosa is noted as escaped and often naturalised elsewhere. Dodge (1914) reported it as "planted and apparently spreading near Kingsville, Essex Co., in S. Ont., but (1915) not spreading in Lambton Co., somewhat further north" (cited in Scoggan 1979: 1390). *C. speciosa* is only noted as "commonly planted" by Morton and Venn (1990: 73) and Cruise (1969: 100). *C. bignonoides* is, however, noted as "persisting" by both authorities.

The occurrence of these three young trees shows that the Western Catalpa has been able to take advantage of the climatic amelioration in the Toronto area, either due to the "city effect" raising

the minimum temperatures in the area during the past two decades, or due to the more general climatic warming. The setting of viable seeds in about 1984 may have reflected an exceptionally good mast year, as no other seedlings have been located. During the 1950s, when I was a graduate student at the University of Toronto, I attempted to find fertile seeds of *Catalpa*, but found none in more than 50 pods examined over a few years.

These young trees may reflect the effects of a general climatic warming, of the localised climatic amelioration, especially in winter, of the "city effect", or of the immigration into Toronto of the insect that fertilises *Catalpa*. As bees visit *Catalpa* flowers, the latter seems an unlikely possibility. However, the absence of other seedings suggests that an exceptional seed year due to climatic change may be the reason for the presence of these three trees.

Acknowledgments

I thank Jim Hodgins of the Department of Zoology, University of Toronto, for his help in producing this note, and my wife Bee for the photograph used in Figure 1.

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Received 25 July 1991
Accepted 30 March 1992

Do Estrous Female Gray Squirrels, *Sciurus carolinensis*, Advertise Their Receptivity?

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Koprowski, John L. 1992. Do estrous female Gray Squirrels, *Sciurus carolinensis*, advertise their receptivity? Canadian Field-Naturalist 106(3): 392–394.

Female Eastern Gray Squirrels occasionally vocalize during their single day of estrus. During mating bouts, males aggregate near and pursue females. However, females often avoid overt conflict among males and remain motionless in the tree canopy. If the males did not relocate the female within 15 min, I observed females on five occasions emit a high pitched vocalization which males used to locate the female. The first male to relocate the female mated with her. These observations suggest that estrous females may advertise their location to males.

Key Words: Eastern Gray Squirrel, *Sciurus carolinensis*, vocalizations, reproductive behavior, advertisement.

Vocalizations and advertisement calls by male mammals are common during courtship and mating behavior (Clutton-Brock et al. 1982; Ewer 1968). However, non-aggressive vocalizations of the female that may attract males are reported rarely except in some species of felids and canids (reviewed by Ewer 1968), ungulates (Fraser 1968), pinnipeds (LeBouef 1978) and primates (Galdikas 1981; Harcourt et al. 1981).

In Eastern Gray Squirrels (*Sciurus carolinensis*), as many as 34 males chase a female on her single day of estrus (Goodrum 1961). Males call throughout the chase (Lishak 1982). Olfactory cues likely are important in the location of an estrous female (Thompson 1977); however, after a female avoids the pursuing males, males may use visual cues to find the female (Koprowski 1991). The female frequently avoids the pursuing males, sits motionless in