1.3.16 Modified Miller dendrites

The methods used by Miller to construct his example S has also been applied to get a modification D of S in [Charatonik 1979, Chapter IV, p. 230] (an outline of this construction is in [Caratonik 1977]). Below we summarize properties of this example, and recall an extension of this construction.

1. There exists a dendrite D such that:
   (a) each point of D is of order nor greater than 4;
   (b) for each $n \in \{1, 2, 3, 4\}$ the set of all points of D which are of order n is dense in D;
   (c) D is strongly rigid;
   (d) D is chaotic.

2. For any two integers m and n with $3 \le m < n$ there exists a dendrite $X(m, n)$ such that (see [Charatonik et al. 1996, Theorem 5.5, p. 185] and compare also [Charatonik 1999, Theorem 27, p. 24]):
   (a) $\operatorname{ord}(x, X(m, n)) \in \{1, 2, m, n\}$ for each $x \in X(m, n)$.
   (b) Every arc in $X(m, n)$ contains a point of order m in $X(m, n)$.
   (c) Each of the sets: of all end points of $X(m, n)$, of all points of order m in $X(m, n)$ and of all points of order n in $X(m, n)$ is dense in $X(m, n)$.
   (d) $X(m, n)$ is strongly chaotic.

   Dendrite D is called a *modified Miller dendrite* . (For a further modification of the above construction that leads to chaotic, strongly rigid, openly rigid and not strongly chaotic dendrites, see [Charatonik 2000, Theorem 3.14, p. 650].)

   Finally recall dendrites constructed in [Charatonik 1999, Examples 33 and 35, p. 28].

3. For each natural $n \ge 5$, there exists a strongly rigid and not chaotic dendrite, all points of which are of order at most n ([Charatonik 1999, Example 33, p. 28]).

4. There exists a rigid dendrite which is neither chaotic nor strongly rigid ([Charatonik 1999, Example 35, p. 28]).

1.3.17 Dendrites with the closed set of end points

Dendrites in this class have been already characterized (see Property 2 in 1.3.4). Besides any tree, the locally connected comb W_R comb W_R is an example of a dendrite having the set of its end points closed (and countable). Below we recall a member of the considered class having uncountably many end points.