

Late, Isolated Plants Display Differing Reproductive Success in *Echinacea angustifolia*

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INTRODUCTION

Once spanning the central United States, many communities of *E. angustifolia* have experienced drastic habitat fragmentation. In order to maintain population sizes and growth rates, we must consider factors that are limiting plants from receiving enough pollen and producing seeds.

I looked at plants at extreme phenological and spatial locations in order to see how dependent the seed set of *angustifolia* is on these factors. We expect spatial location to be a significant factor in seed set.

Additionally, pollen limitation and seed set can be determined by flowering phenology, or when and how long the *E. angustifolia* blooms in order to attract pollinators.

METHODS

-Geospatial data from 1400 plants from 14 remnant prairies were used to determine the plants spatial and temporal attributes

-Achenes were picked from the heads of the plants and were separated into three categories: top, middle and bottom

-Achenes in the middle were randomly selected, and were picked after the “top” and “bottom” achenes were picked. Data presented is based on “middle” achenes

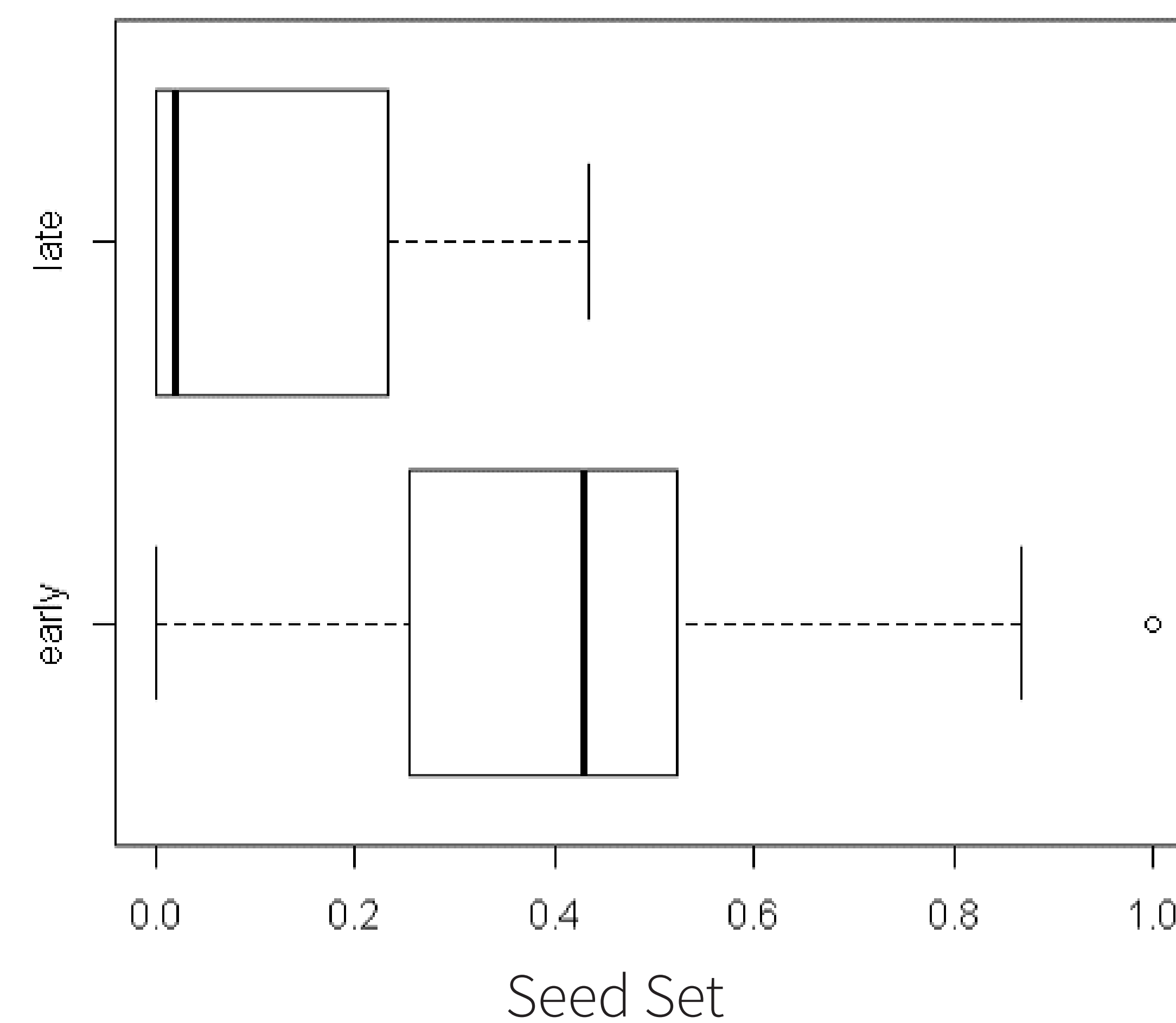
-Seed Set: (Achenes w/ Seeds) / (Total Viable Achenes)

-Closeness is a plant’s distance to its fifth nearest neighbor

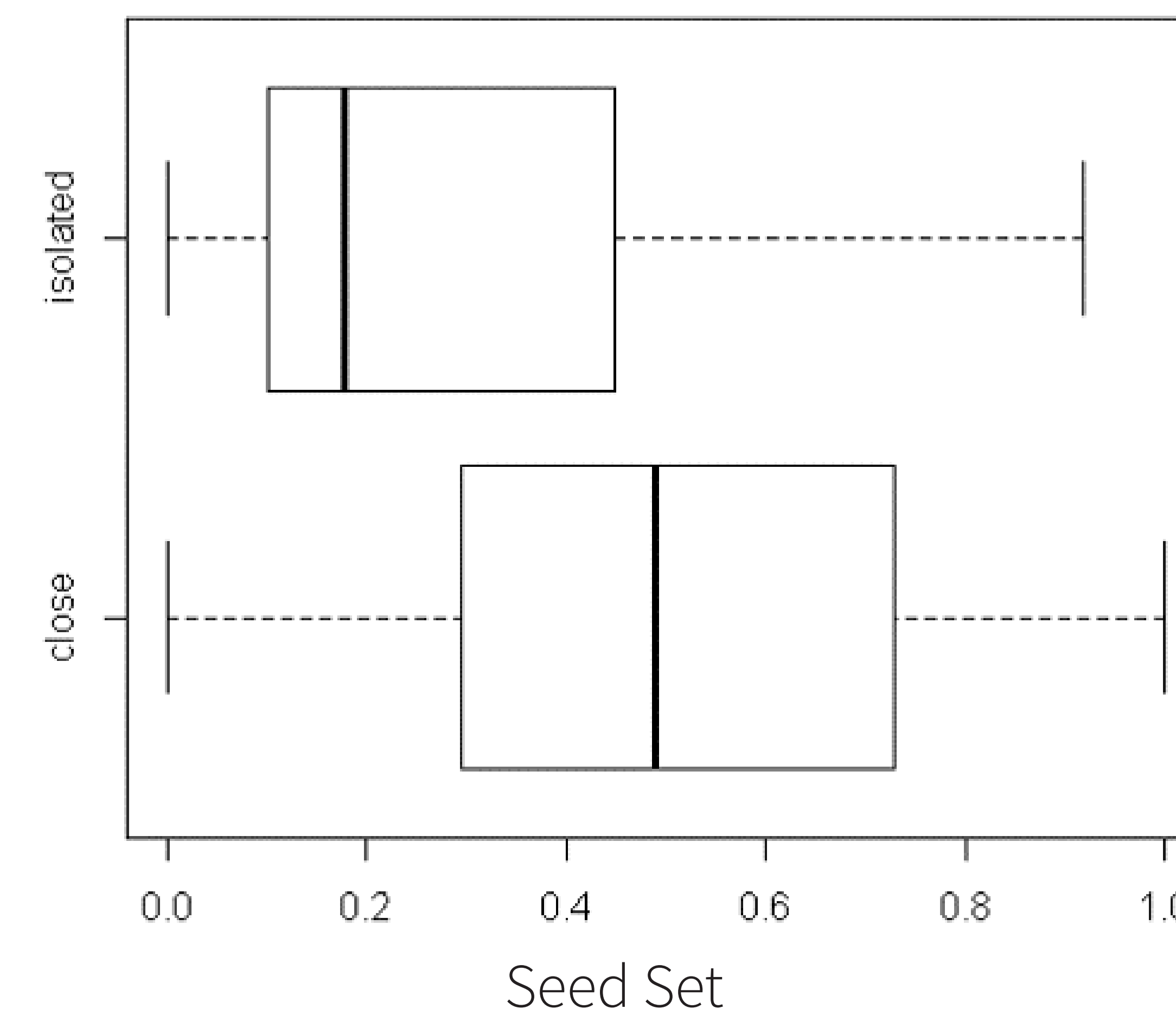
-Achenes were x-rayed in order to determine if they had seeds

RESULTS

Early flowering plants are better pollinated than late plants



Closer plants are better pollinated than isolated plants



Seed set differed between early and late flowering plants (GLM, $n=28$, $p<0.001$)

Seed set differed between close and isolated plants (GLM, $n=28$, $p<0.001$)

CONCLUSION

-Close plants and plants that flower early tend to have a higher seed set

-Data attributed to spatial location overlaps more than the data attributed to flowering phenology, and this suggests that flowering phenology is a bigger factor to pollen limitation and seed set.

-There could be a “temporal isolation” that comes with flowering phenology if they lack synchrony.

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