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Diferencias: literatura primaria vs secundaria

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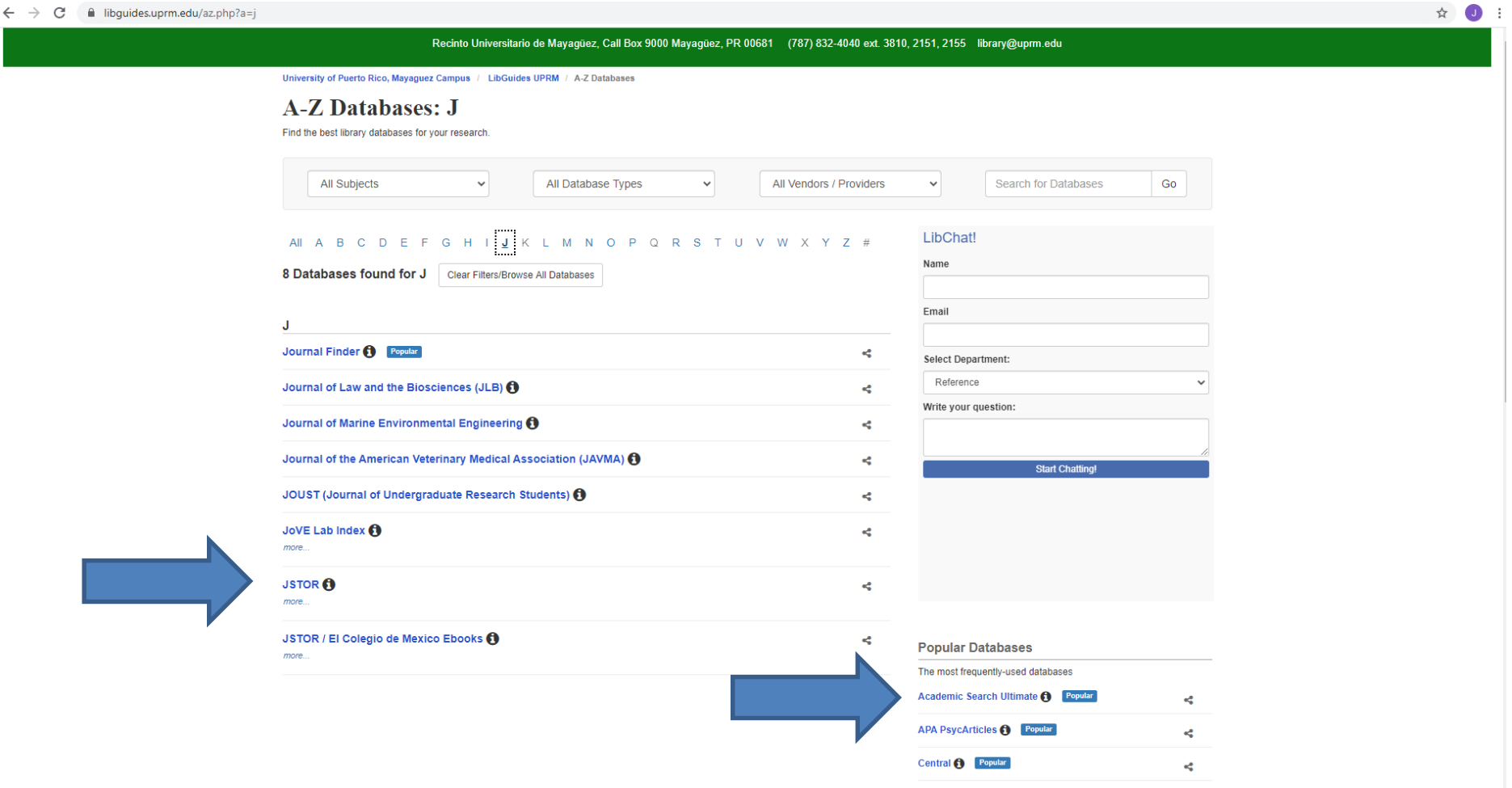

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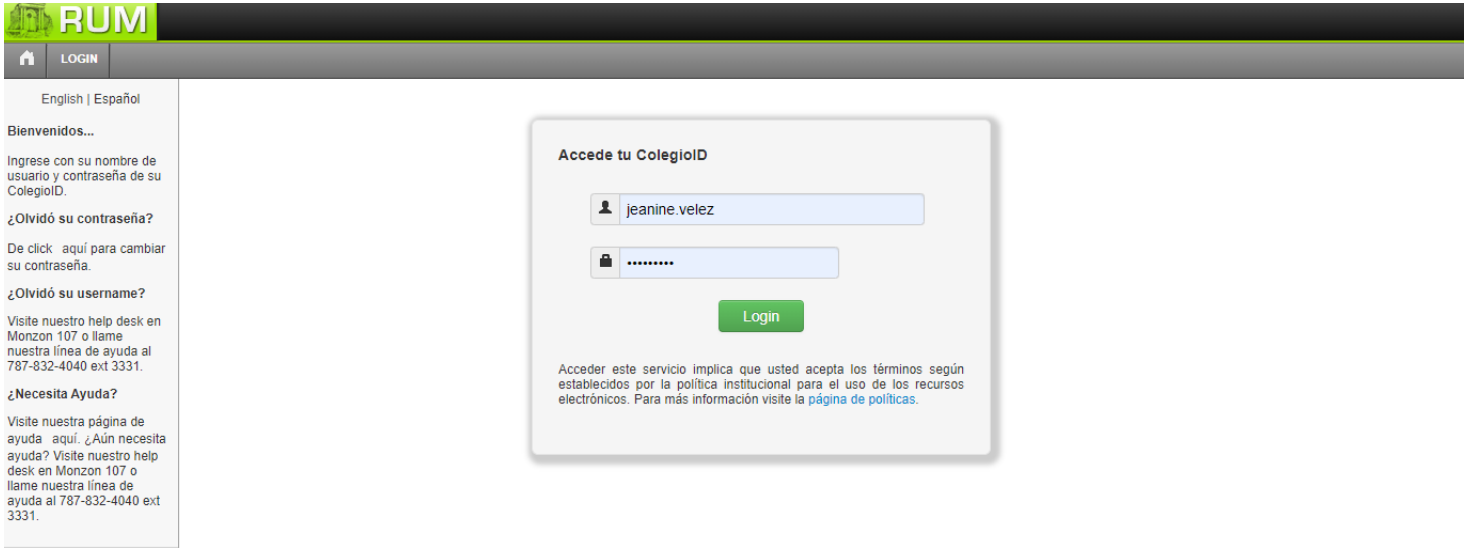

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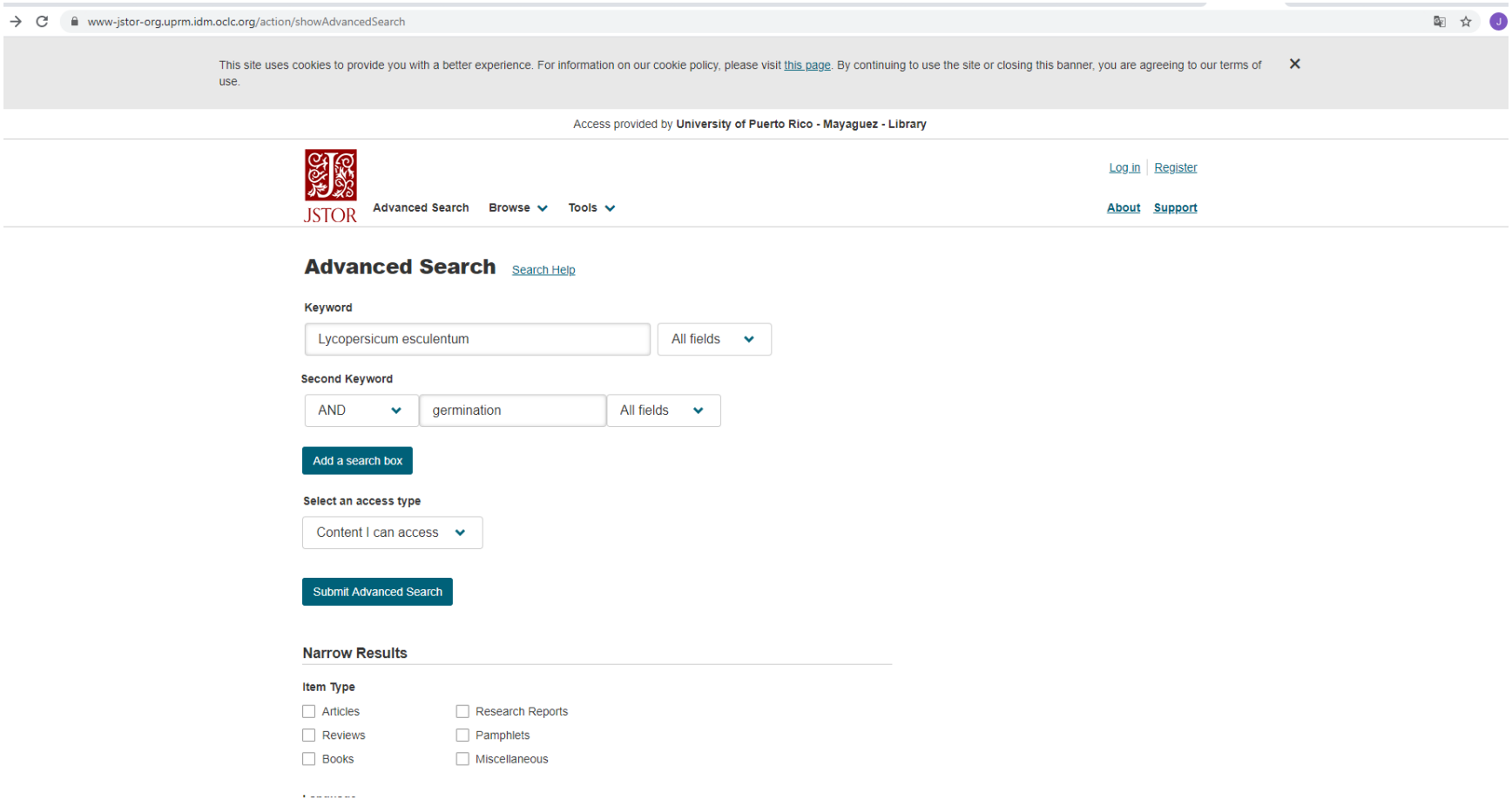

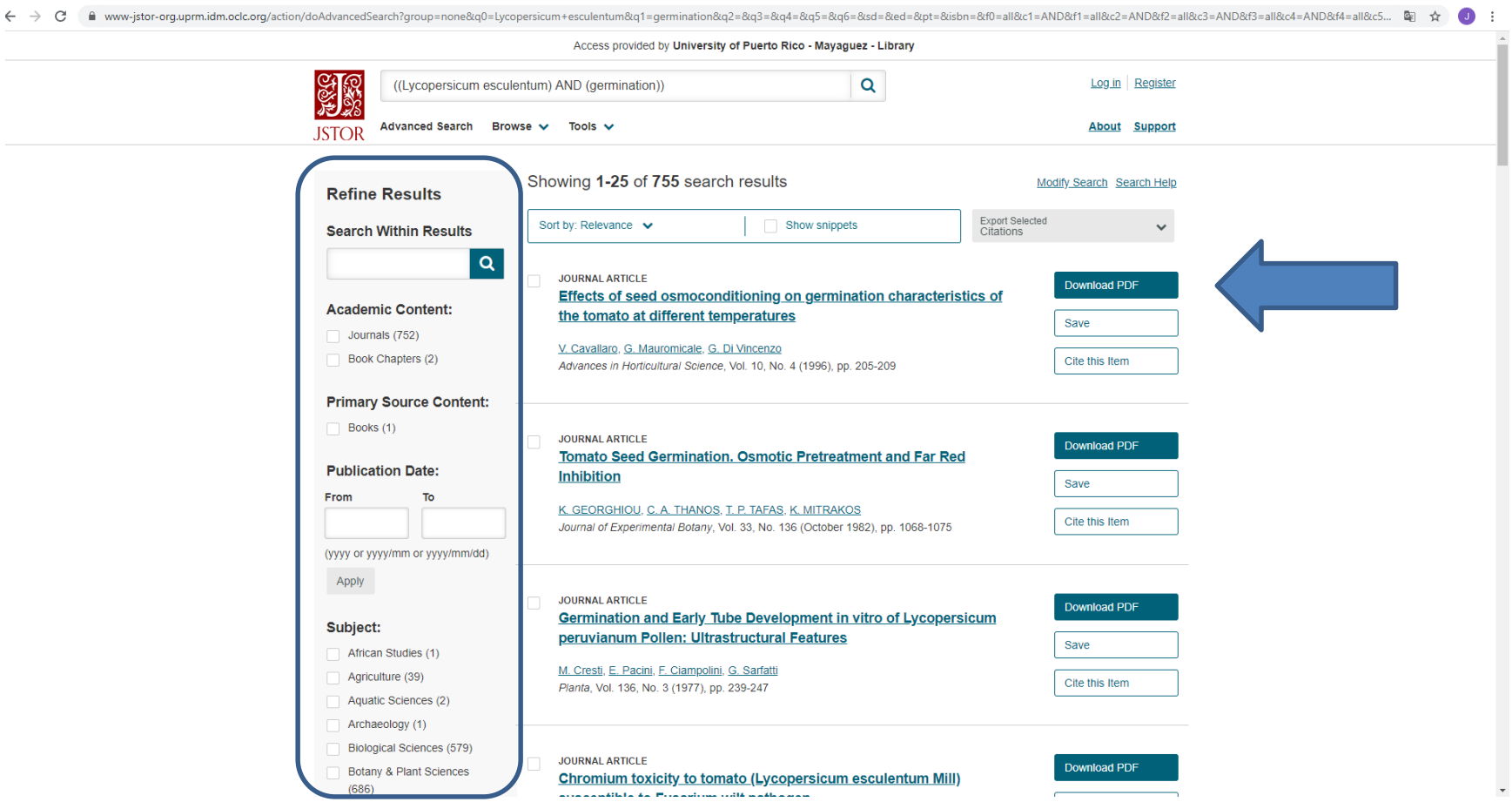
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Effects of seed osmoconditioning on germination characteristics of the tomato at different temperatures

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Key words: *Lycopersicon esculentum* Mill., seed osmopriming, suboptimal germination temperature.

Abstract: In a laboratory trial, the effects of seed osmoconditioning on germination characteristics of the tomato (*Lycopersicon esculentum* Mill. cv. Rio fuego) at various temperatures (6, 8, 10, 12, 14, 16, 18, 20 and 25°C) were studied. Seeds were primed in aerated solutions at equivalent potentials (-0.9 MPa) of polyethylene glycol (PEG) 6000 or KNO_3+K_2HPO_4, in a dark room at 20±1°C for 6 or 8 days. The osmoconditioning treatments improved germination rate at optimal or sub-optimal germination temperatures. Regardless of germination temperature, in fact, mean time of germination, which was 9.3 days in unprimed seeds, was significantly reduced by 15 and 36% in seeds primed with PEG for 6 or 8 days, respectively, and by 34 and 44% in seeds primed with KNO_3+K_2HPO_4 for 6 or 8 days, respectively. Osmoconditioning, except that with PEG for 6 days, improved final germination percentage only at the germination temperatures of 6, 8 and 10°C. In particular, at 8°C, germination percentage, which was 5% in the control, ranged between 26% (seeds primed for 8 days in PEG solution) and 39% (seeds primed for 8 days in KNO_3+K_2HPO_4 solution).

1. Introduction

The tomato (*Lycopersicon esculentum* Mill.) is a crop whose seed is able to germinate over a wide range of temperatures from 8-10°C to 35-38°C. However, the optimum germination temperatures are 20-25°C (Bierhuizen and Wagenvoort, 1974; Thompson, 1974) and the rate and final germination are markedly reduced below 12-15°C (Jaworski and Valli, 1965).

Since the particular climatic conditions of the Mediterranean region permit off-season production, early sowings in winter or in early spring are often necessary and, as a consequence, seeds may encounter temperatures equal or almost equal to the minimum germination temperature. In these conditions seeds take longer to germinate so they are subject to pest and pathogen attack, water and salinity stress and, particularly in result (Herner, 1986; Leskovar and Sims, 1987).

Seed treatments with osmotic solutions (osmopriming) proposed by Heydecker in 1974 may constitute a useful tool in overcoming these problems. Osmotic solutions, in fact, determine an osmotic barrier which prevents radicle emergence but allows seeds to imbibe and to complete the early phases of germination under controlled conditions. When subsequently planted, such seeds germinate more rapidly and uniformly even under adverse temperature and moisture conditions (Bradford, 1986).

In the specific case of tomato, among the osmotic solutions recommended, best results on germination even under low temperatures were obtained with polyethylene glycol (PEG), an organic compound of high molecular weight, inert and non-toxic for seeds, and with some inorganic salts such as potassium nitrate and

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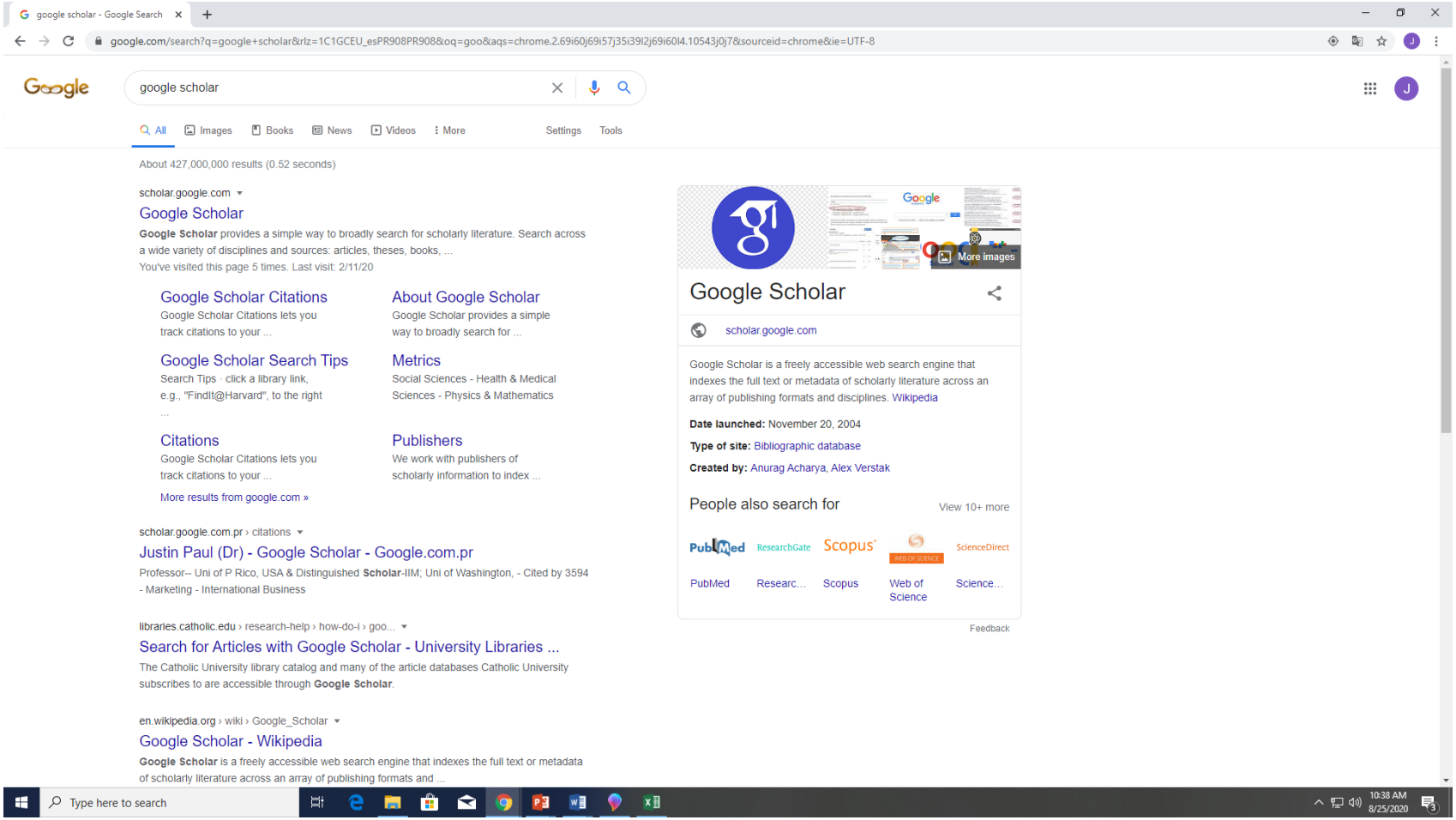

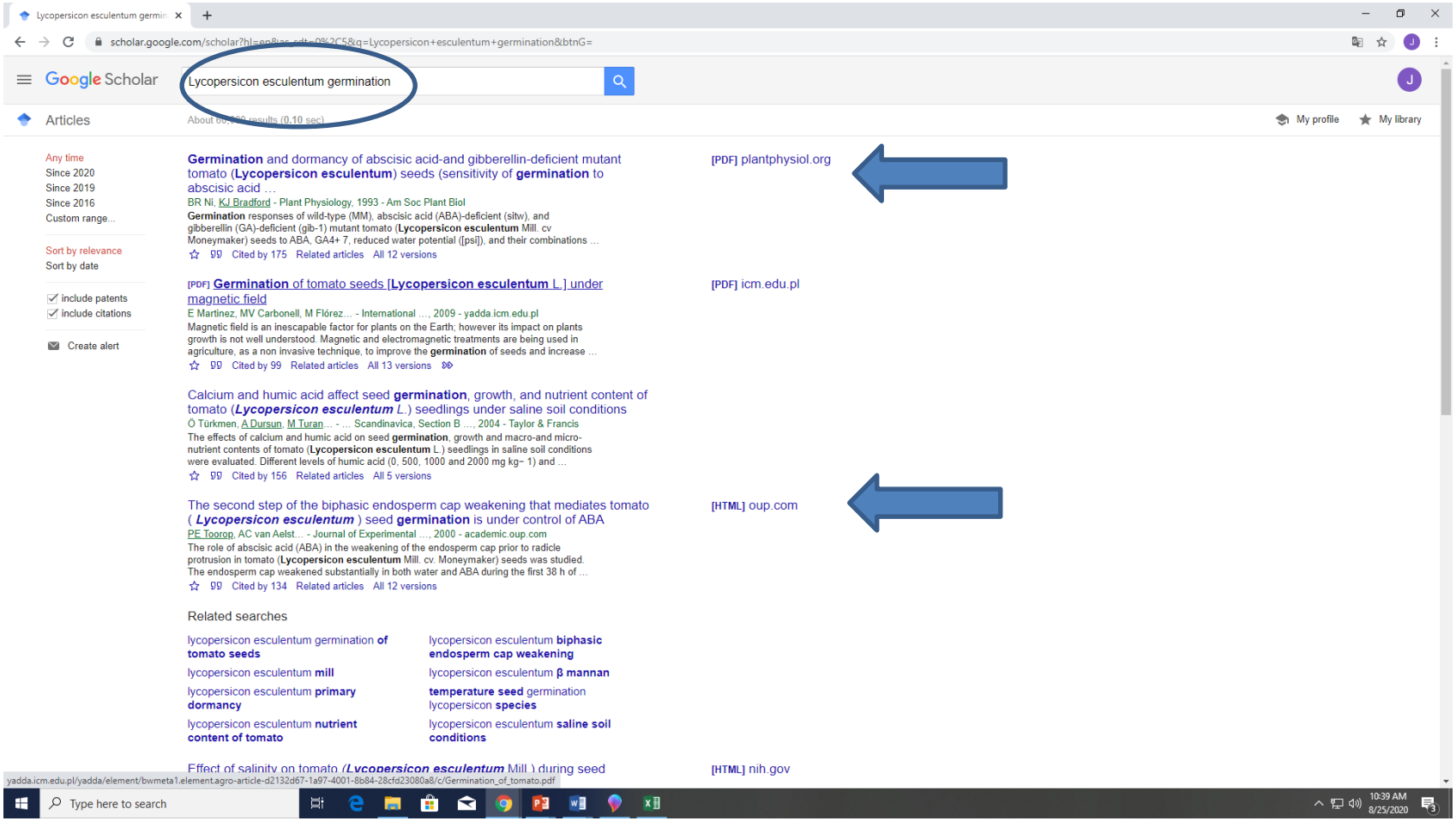
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