

Update on the Prevalence of Allergic Sensitization to Russian thistle in South-eastern Ontario; a Retrospective Chart Review

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Introduction

Allergic rhinitis and allergen-induced asthma often occur concomitantly and are thought to be a part of the same spectrum of disease. Allergen induced asthma and allergic rhinitis are caused by an immunoglobulin E (IgE)-mediated reaction to the protein and glycoprotein components of inhaled aeroallergens such as pollens, moulds and animal dander. The prevalence of allergic rhinitis and allergen induced asthma is increasing. It is believed that up to 40% of adults suffer from allergic rhinitis and 75% of adults with asthma have an allergic component.

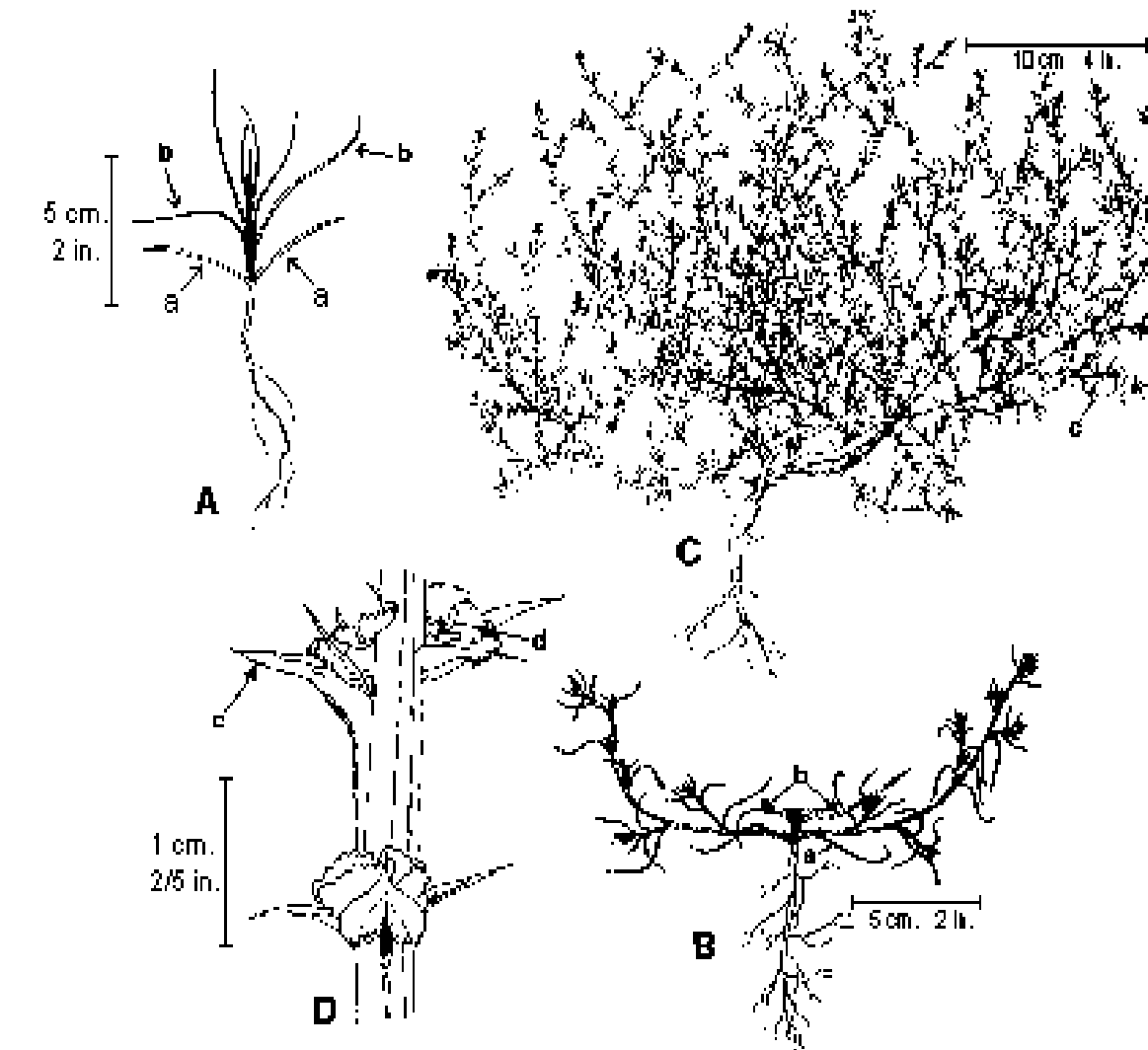


Figure 1: A. Seedling. B. Base of young plant. C. Mature plant. D. Portion of branch with 3 flowers

Russian thistle (*Salsola pestifer* A. Nels.), commonly known as tumbleweed, has recently been identified as an allergen with a higher than expected prevalence of skin test positivity in an unselected patient population. This previously unrecognized antigen was identified as having positive skin-test responses of over 15% of skin-tested individuals in the third phase of the National Health and Nutrition Examination Surveys conducted throughout the USA between 1988 and 1994.

Methods

A retrospective chart review was conducted at the Queen's University Allergy and Immunology clinic representing patients residing in Kingston and the South-eastern Ontario catchment area. Patients age, gender, skin test reaction and the presence or absence of clinical features were recorded. Relevant clinical symptoms were documented as well as the rate of sensitization amongst tested individuals. Specific clinical parameters on history included nasal congestion, sneezing, rhinorrhoea and pruritis of the nose, eyes, palate for allergic rhinitis. Wheezing, chest tightness and cough were clinical detection parameters for asthma.

A standardized extract to Russian thistle (Hollister-Steir) was used in all tested patients. Only patients with appropriate histamine responses were included in our data. We collected demographic data in addition to the presence/absence of relevant clinical symptoms.

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Background: Russian thistle (RT) was identified as a potentially clinically significant allergen in the third phase of the National Health and Nutrition Examination Surveys conducted in the USA (1988 - 1994) with over 15% of tested individuals having sensitivity to this allergen. The rate of skin-test positivity for RT in Canada is unknown, however, a previously estimated prevalence in the Kingston and Southeastern Ontario catchment area was approximately 10%. RT was subsequently added to the standard environmental allergen panel for skin testing at the Queen's University Allergy and Immunology clinic.

Objective: To determine the updated prevalence rate of skin test positivity to Russian Thistle in patients from Kingston and the Southeastern Ontario catchment area, in an unselected patient population.

Methods: A chart review was completed to document the rate of sensitization amongst tested patients to RT extract (ALK-Abello). Only patients with appropriate histamine responses were included. We collected demographic data in addition to the presence/absence of relevant clinical symptoms and presence of positive skin test responses to potential cross-reacting allergens.

Results: Of 609 charts reviewed, 304 patients underwent skin testing for Russian thistle. Of these, 43 (13.8%) were positive. Of the test-positive cohort, 86% (37/43) had clinically relevant symptoms of either allergic rhinitis or asthma. 41% (18/43) had symptoms that correlated with the predominant RT pollen season (August-October). 93% and 58% of these persons had concomitant positive skin tests to ragweed and birch; allergens with known cross-reactivity.

Conclusions: This updated chart review suggests that the prevalence of skin test positivity to Russian thistle in the Kingston and South-eastern Ontario area is approximately 14%, with over 40% of patients reporting seasonally correlating symptoms. A high degree of cross-reactivity with ragweed than previously known may exist. Continuing to include Russian thistle in a routine skin testing panel may better establish the clinical significance of this environmental allergen.

Objective

Given the increasing burden of allergen mediated diseases and allergen-induced asthma, combined with anecdotal data from the NHANES III trial (suggesting this previously unrecognized allergen to be a potentially significant cause of allergen mediated disease) our primary objective was to determine the prevalence of skin test positivity to Russian thistle in patients from Kingston and the Southeastern Ontario catchment area and to determine the clinical significance of these results.



Figure 2: Russian Thistle

Results

- 609 charts were reviewed in the Queen's University Allergy and Immunology Clinic
- 304 of these patients were skin tested for Russian thistle using a standardized allergen reagent (n=304)
- Of these, 13.8% (43) were found to have a positive skin test to Russian thistle when compared to an appropriate histamine skin-test response

Results..continued

- Of the skin-test positive cohort, 86% were found to be symptomatic based on history, having clinical features consistent with allergic rhinitis or asthma
- 41% of the skin test positive individuals had symptoms that correlated seasonally with the predominant Russian thistle pollen season (August-October)
- 93% of individuals with positive skin tests to RT had concomitant positive skin test to ragweed
- The median age of skin-test positive individuals was 38 years and mean age was found to be 35 years

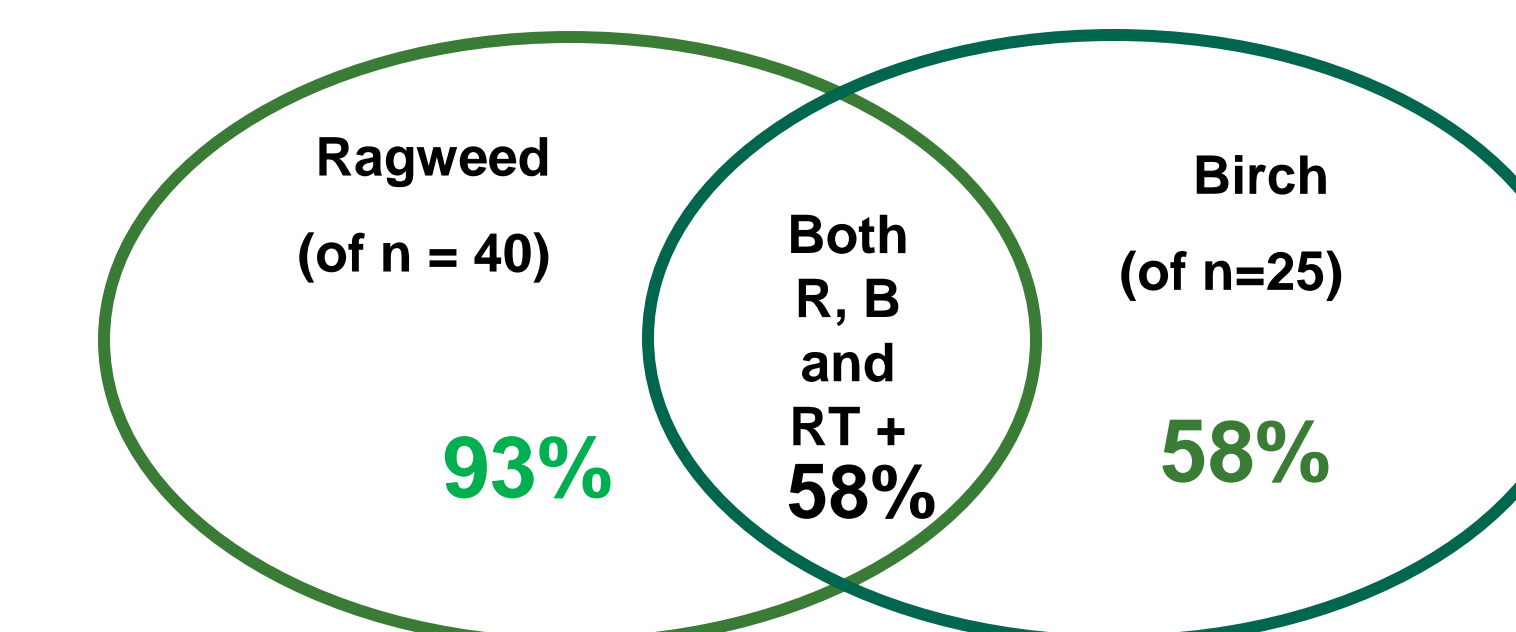


Figure 2: Rates of cross reactivity and overlap

- **Cross reactivity:**
 - Birch, ragweed and kiwi are described antigens with known cross reactivity
- Of the skin-test positive cohort, 93% had concomitant positive skin tests to ragweed
- 58% of the skin test positive cohort also had positive tests to birch

Discussion

- The data suggests that Russian thistle in this particular studied area yields a positive skin test result in ~14% of skin tested patients (in an unselected patient population)
- Almost all patients with a positive skin test were clinically symptomatic with symptoms consistent with either allergic rhinitis and/or asthma
- Among these, over 40% had symptoms that seasonally correlated with the predominant Russian thistle season between August-October
- More females had positive reactions than males amongst the skin-tested positive cohort
- There may be utility in testing patients with known ragweed and birch allergies to Russian thistle, given the rates of cross-reactivity

Conclusions

- Data obtained suggests that the prevalence of skin test positivity to Russian thistle in the studied area is approximately 14%, with over 40% of these individuals reporting correlative seasonal symptoms
- Including Russian thistle in routine skin testing panel may better establish the clinical significance of this environmental allergen