

Sensitivity to *Parietaria* pollen in the Southampton area as determined by skin-prick and RAST tests

S. T. HOLGATE, LINDA JACKSON, H. K. WATSON* and
MARIANNE A. GANDERTON*

Faculty of Medicine, The University of Southampton and *Dome/Hollister-Stier,
Stoke Poges, Slough, U.K.

(Received in original form 5 January 1988 and in revised form 12 May 1988;
accepted for publication 12 May 1988)

Summary

The pollen of *Parietaria* species is a well-recognized and important inhalant allergen in the Mediterranean area. *Parietaria judaica* (Pellitory-of-the-Wall) is native to the U.K., flowering from June to September, but is not usually considered to be of any clinical importance by U.K. allergists. We skin tested 62 patients with a clinical history of summer seasonal respiratory symptoms and a control group of 11 patients with perennial respiratory symptoms only. Each was skin tested in duplicate with extracts of grass pollen, birch pollen, *Parietaria* pollen, *Dermatophagoides pteronyssinus*, *Cladosporium*, *Alternaria*, nettle pollen and negative and positive controls, and serum samples were collected for RAST assays for *Parietaria* and nettle. Eight of the 62 patients in the main group showed skin reactivity to *Parietaria*. Five of these eight had never visited the Mediterranean area and therefore it is possible that sensitization occurred in the U.K. Thirteen of the 62 patients were skin reactive to nettle but there was no correlation between skin reactivity to *Parietaria* and nettle. This supports a recent report that, despite their close botanical relationship, no antigenic cross-reactivity exists between the two species. No correlation was seen between skin reactivity and serum RAST activity to *Parietaria* or nettle. It is not known whether exposure to *Parietaria* pollen contributes to the seasonal symptoms of the patients found to be skin reactive. None of the 11 patients in the control group was skin reactive to *Parietaria*.

Introduction

Parietaria judaica (diffusa) (Fig. 1), a member of the *Urticaceae* family, grows in many locations in the British Isles. It is said to have been introduced by monks to areas near the South Coast of England in the Middle Ages, and has naturalized not only on old abbey ruins but also in the surrounding countryside and has acquired a common



Fig. 1. *Parietaria judaica*.

English name: Pellitory-of-the-Wall*. The flowering season in the British Isles is from June to September.

In the Mediterranean basin the pollen of *Parietaria* is recognized as an important inhalant allergen. In Italy it is regarded as the third commonest inhalant allergen after grass pollen and house dust mite.

The duration of the *Parietaria* pollen season varies with the climate. In Sicily and Southern Italy it can persist from February to December, resulting in almost perennial symptoms, whereas in Northern Italy, Southern France and the Mediterranean coast of Spain, pollination occurs on average from April to September.

The three main Western European species of *Parietaria* are *P. judaica*, *P. officinalis* and *P. lusitanica*. A high degree of antigenic cross-reactivity has been demonstrated between all three species [2-4]. *Parietaria judaica* is the predominant species in Italy, France and Spain. Its geographical distribution in the British Isles is shown in Fig. 2, which demonstrates that it is commoner in the south. Its possible role as a potential allergen in Britain has been ignored.

* Pellitory-of-the-wall is *Parietaria judaica* L. [1], which in the past has been variously classified as *P. officinalis* auct., non L.; *P. ramiflora* auct; *P. diffusa* Mert & Koch.

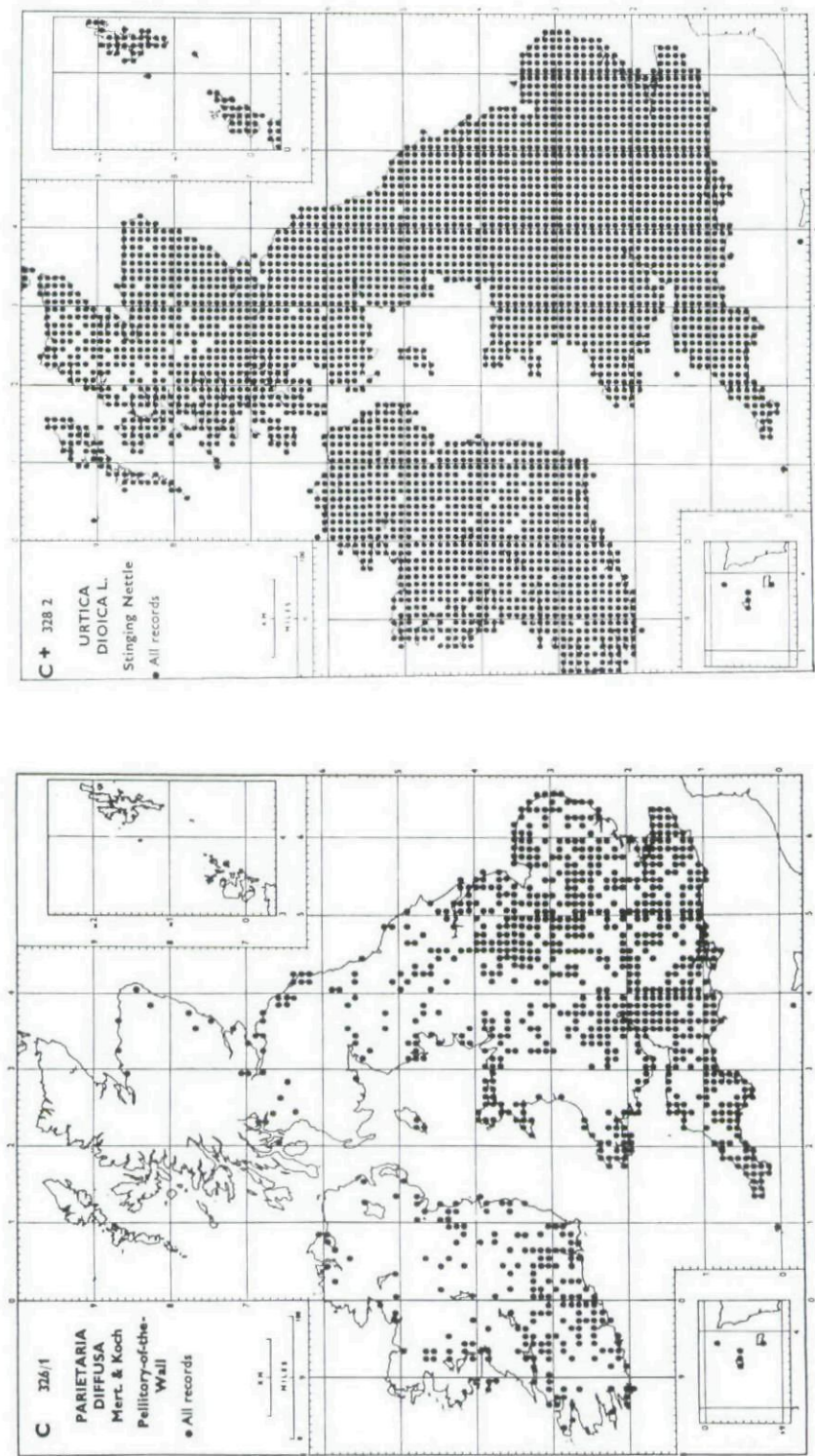


Fig. 2. Distribution of *Parietaria judaica* (diffusa) and *Urtica dioica* in the British Isles. Taken from *Atlas of the British Flora*, 2nd ed.

Edited by F.H. Perring and S.M. Walters. Published for the Botanical Society of the British Isles by E.P. Publishing Ltd, Wakefield, 1976. By kind permission.

Figure 2 also shows the distribution of nettle *Urtica dioica*, another member of the *Urticaceae*, a known cause of summer seasonal rhinitis [5].

It is very probable that the pollinating seasons of these two *Urticaceae* overlap or coincide. Pollen counts, however, are usually quoted as '*Urticaceae*', with no attempt being made to distinguish between the species—and indeed the size and microscopic appearance of the pollens is so similar that it is impossible to do so. In the past it has been assumed that *Urticaceae* pollen counts in Britain consisted of nettle pollen only.

It is not known whether residents of this country may become sensitized to *Parietaria* as a result of local exposure or alternatively during travel in the Mediterranean area. It was therefore decided to determine the prevalence of skin reactivity and the serum RAST reactivity to *Parietaria judaica* in allergic patients in the Southampton area of southern England.

Subjects and methods

Patients

The test group consisted of 50 patients with summer hay fever and 13 patients who suffered from perennial symptoms as well as summer hay fever.

The control group consisted of 11 patients with perennial symptoms of inhalant allergy with no worsening in the summer.

Method

Skin-prick tests were performed in duplicate—once on the flexor aspect of each forearm—using DHS standardized lancets and extracts (Dome/Hollister-Stier, Slough, U.K.) of two grass mix (*Phleum pratense* and *Dactylis glomerata*), birch (*Betula pendula*), *Parietaria judaica*, nettle (*Urtica dioica*), *Dermatophagoides pteronyssinus*, *Alternaria tenuis*, *Cladosporium herbarum* and positive and negative controls. The order of testing was randomized between patients but the order of the tests on each patient was the same on each forearm. After 15 min, weals were outlined with a felt-tip pen and outlines transferred to report forms with adhesive tape. Weal areas were calculated by planimetry. The trial was open.

Serology

A serum sample was obtained from each patient, stored at -20°C and subsequently assayed for *Parietaria*- and *Urtica*-specific IgE, by Ann Bevan of Dome/Hollister-Stier, using discs prepared with material from the same source as the skin tests.

All tests were performed between 10 March and 21 May 1986.

Results

Test group

Sixty-three patients aged 16–50 years were tested. One was excluded from the analysis because of dermatographia. Of the 62 remaining (29 males and 33 females), 50 had symptoms during the summer months only and 12 had perennial symptoms with marked worsening during the summer.

Figure 3 shows the number of patients giving positive skin tests to each of the extracts used. Figure 4 shows the distribution of positive skin tests to grass, *Parietaria* and nettle. Eight of the 62 patients were skin-test positive to *Parietaria*, 13 were

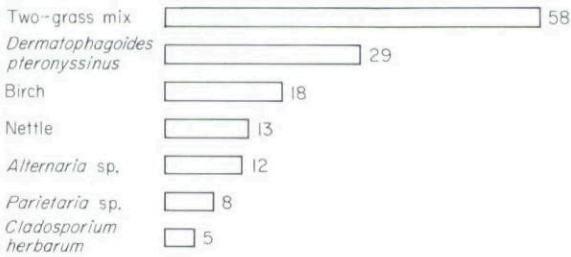


Fig. 3. Sixty-two patients with summer hay fever: distribution of positive skin tests.

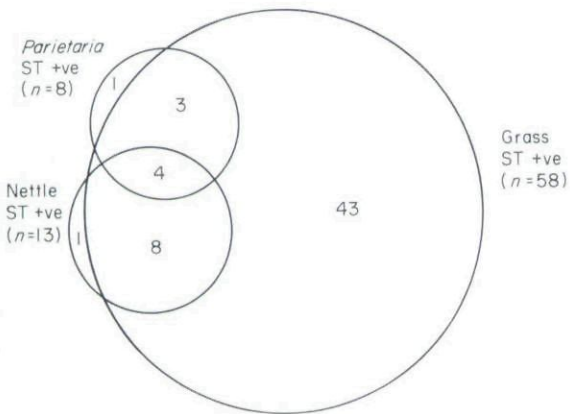


Fig. 4. Sixty-two patients with summer hay fever: distribution of positive skin tests to grass, *Parietaria* and nettle.

positive to nettle and four of these were sensitive to both; two gave no positive skin tests to any of the seasonal allergens tested.

The 12 patients who had perennial symptoms with worsening in the summer were all skin-test positive to *D. pteronyssinus*, nine were grass sensitive, one was *Parietaria* sensitive and two gave no positive skin tests to any of the seasonal allergens tested.

Control group

Eleven patients (six males and five females), age range 13–50 years, with purely perennial symptoms without summer exacerbation, were also tested.

All 11 had positive skin tests to *D. pteronyssinus* and one was also known to be skin-test positive to dog and horse dander. Six had positive skin tests to some of the seasonal allergens tested but no exacerbation of symptoms during the summer. None was skin reactive to *Parietaria* or nettle.

Serology: test group

Figure 5 shows the correlation between skin test and RAST results with *Parietaria* and nettle. Of the 62 patients, 26 had a *Parietaria* RAST of class 1 or more. Of the eight patients giving a positive skin to *Parietaria*, five had a positive RAST (two a score of 2 and three a score of 1) and three were negative. Twenty-one patients had *Parietaria* serum RASTs of 1 or more (14 a score of 1, six a score of 2 and one a score of 3) but

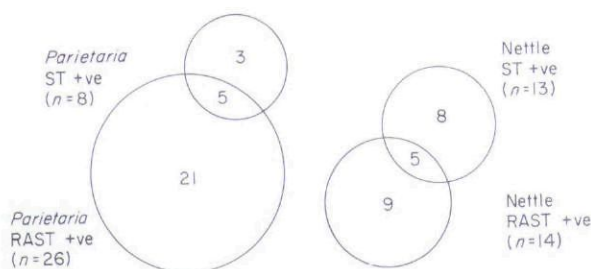


Fig. 5. Sixty-two patients with summer hay fever: correlation between skin tests and RAST results with *Parietaria* and nettle.

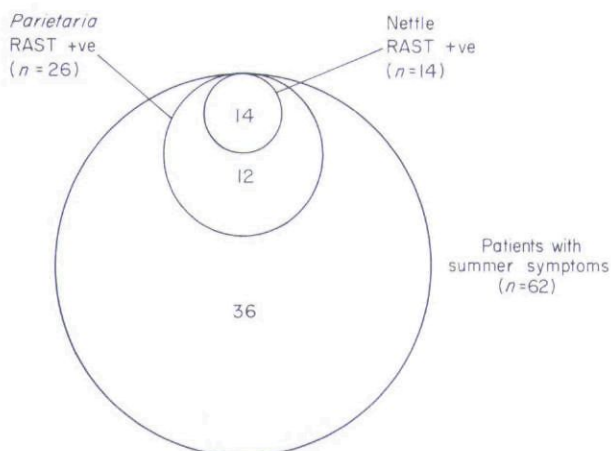


Fig. 6. Sixty-two patients with summer hay fever: correlation between nettle and *Parietaria* RASTs.

negative skin tests to *Parietaria*. There were 14 patients with nettle RAST of class 1 or more.

Of the 13 patients positive to nettle on skin testing, five had a RAST score of 1 or more to nettle and eight had negative RASTs. Nine other patients had nettle RAST scores of 1 or more, but negative nettle skin tests. All 14 patients with a positive nettle RAST of score 1 or more also had a positive *Parietaria* RAST (Fig. 6).

Of the 26 patients with a *Parietaria* RAST score of 1 or more, nine had a score of 2 or more. All nine had nettle RAST scores of 1 or more.

Serology: control group

Three patients with purely perennial symptoms also had a positive *Parietaria* RAST and one had a positive nettle RAST.

Environmental exposure to *Parietaria*

Of the eight *Parietaria* skin-test positive patients, three reported visiting the Mediterranean before the trial, of whom only one had made more than one visit. The

patient who had a positive skin test to *Parietaria* but a negative skin test to grass pollen was in the group who had made one visit.

Of the 26 *Parietaria* RAST positive patients, eight reported visiting the Mediterranean before the trial, of whom six had made more than one visit. In three of the 26, travel information was not available.

Discussion

Eight out of 62 patients (13%) with apparently characteristic symptoms during the hay fever season showed a positive skin test to *Parietaria*, and 26 (42%) showed a positive RAST test to *Parietaria*, which is considered to be a Mediterranean allergen. *Parietaria* was the only seasonal allergen to which one of these patients reacted. Many of these patients have never visited the Mediterranean, and we suggest that they were sensitized in Britain. As no provocation tests were performed, we do not know whether *Parietaria* actually causes symptoms in these patients, but the possibility should certainly be considered.

One patient with apparently typical hay fever reacted only to nettle, thus emphasizing the importance of meticulous anamnesis and illustrating why immunotherapy with grass pollen extracts, without proper history and skin tests, may prove ineffective.

There was no correlation between the RAST and skin tests for either nettle or *Parietaria* pollen, although testing materials were obtained from the same source. Other authors have commented on this phenomenon [6].

There was no correlation between positive skin tests to nettle and *Parietaria*, despite the close botanical relationship, which is often considered to predispose to allergy to a whole group of plants. This would seem to agree with the view of Bousquet *et al.* [7] that there is no cross-antigenicity between nettle and *Parietaria* pollens. Conversely, every patient with a nettle RAST score of 1 or more had a positive *Parietaria* RAST, and every patient with a *Parietaria* RAST score of 2 or more had a positive nettle RAST, suggesting that there is some degree of cross-antigenicity, and possibly that there was a difference in the specificity of the two RAST assay systems.

There may be higher non-specific background reactivity to *Parietaria* so that a RAST score of less than 2 is of no clinical importance. Some of this non-specific reactivity of IgE antibodies may resemble the cross-reactions that occur between entirely unrelated allergens, for instance between birch pollen, apple, celery and other vegetables that belong to an entirely different genus, and even hymenoptera venom [8,9]. Al-Tikriti *et al.* [10] have suggested that positive skin-test reactions can be elicited to materials that are not pertinent to the geographical test area, and that this is probably due to the same sort of cross-reactivity as between unrelated allergens. It may be that some moderately common but unidentified factor in our environment cross-reacts with *Parietaria*; or that in the case of *Parietaria* larger amounts of unbound immunoglobulin are present in the serum. Finally, it may be that exposure to *Parietaria* is much greater than previously believed; while the number of nettle (*Urtica dioica*) plants is steadily decreasing due to modern methods of verge spraying and agriculture, concentrations of *Parietaria judaica* have steadily increased—*Parietaria* has, for instance, also become widely established throughout the Thames Valley.

Since *Parietaria* and nettle pollens are not separately identified in pollen counts, it is not known how much of the Urticaceae pollen cloud, previously supposed to be nettle, is in fact due to *Parietaria*. Provocation tests would be required to determine the

prevalence of clinical symptoms due to *Parietaria*. The possibility of such allergy has probably existed for many years, as illustrated by the fact that many of our *Parietaria*-positive patients had never travelled to the Mediterranean, but it must become even more likely as more people travel to countries where *Parietaria* is a common and potent allergen.

Acknowledgments

We would like to thank Miss A. Bevan for performing the immunological tests and Mrs Pauline Birger for her help with typing.

References

- 1 Clapham AR, Tutin TG, Moore DM. Flora of the British Isles. 3rd ed. Cambridge: Cambridge University Press, 1987.
- 2 Geraci D *et al.* Immunochemical characterisation of antigens of *Parietaria judaica* pollen. *Int Arch Allergy Appl Immunol* 1985; 78:421–8.
- 3 Constable DW, Parotelli R, Verga AE, Tursi A. Comparison of *Parietaria* pollen species (*P. judaica* and *P. officinalis*). Abstracts European Academy of Allergy and Clinical Immunology. Stockholm, 1985.
- 4 Corbi AL *et al.* Cross reactivity between *P. judaica* and *P. officinalis*. *Ann Allergy* 1985; 54:142–7.
- 5 Wüthrich B, Annen H. Pollinosis: I. Findings on the clinical aspects and the pollen spectrum in 1565 pollen sensitive patients. *Schweiz Med Wochenschr* 1979; 109:1212–8.
- 6 Haahtela T, Jaakonmäki I. Relationship of allergen-specific IgE antibodies, skin prick tests and allergic disorders in unselected adolescents. *Allergy* 1981; 36:251–6.
- 7 Bousquet J, Hewitt B, Guérin B, Ohivert H, Michel FB. Allergy in the Mediterranean area II: Cross-allergenicity among Urticaceae pollens (*Parietaria* and *Urtica*). *Clin Allergy* 1986; 16:57–64.
- 8 Aalberse RC, Koshte V, Clemens JGJ. Immunoglobulin E antibodies that cross-react with vegetable foods, pollen and *Hymenoptera* venom. *J Allergy Clin Immunol* 1981; 68:356–64.
- 9 Halmepura L, Vuontela K, Kalimo K, Björkstén F. Cross-reactivity of IgE antibodies with allergens in birch pollen, fruits and vegetables. *Int Arch Allergy Appl Immunol* 1984; 74:235–40.
- 10 Al-Tikriti SK, Al Salihi M, Everett Gaillard G. Pollen and mould survey of Baghdad, Iraq. *Ann Allergy* 1980; 45:97–9.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.