232. Tetraselago wilmsii (Rolfe) Hilliard & Burtt, **comb. nov.**
Type: E. Transvaal, Lydenburg distr., Paardeplaats, *Wilms* 1163 (K, iso. E).
Syn.: *Selago wilmsii* Rolfe in Dyer, Fl. Cap. 5,1:151 (1901).
Selago aggregata Rolfe in Dyer, Fl. Cap. 5,1:152 (1901). Types: E Transvaal, Lydenburg distr., Paardeplaats, *Wilms* 1165a (K, E); near Lydenburg, *Wilms* 1165 (K, E); Natal, near Greytown, *Wilms* 2193 (K).

The species has not been re-collected in Natal and as some of Wilms's other specimens labelled Greytown have aroused suspicion, the occurrence of this species in Natal requires confirmation. Otherwise it is known only from the eastern and south-eastern Transvaal.

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Book Review

Chemotaxonomy of Plants.* Any attempt to integrate the unsympathetic disciplines of chemistry and biology has to take account of the varied tasks and interests of the organic chemist on the one hand and the taxonomist on the other, and at the same time offer something to both. The current success of chemical taxonomy is that it does just that. Like North Sea oil, it has come at a time when taxonomy is running out of fuel, and it comes to organic chemists like a second wife, to revive their flagging interest. The information offered by both micromolecules, and the larger proteins and nucleic acids is now becoming increasingly incorporated into taxonomic decision-making. Data are relatively easily obtained for many of the chemicals and many plants can often be screened in the course of experiments. But the pitfalls to the taxonomist are that he is not always sure how to handle this new array of information, what weight (if any) he should give it and what sense to make of conflicting data. Often he has little knowledge of the chemicals he is studying, with scant idea of, and worse still little interest in, their biosynthetic pathways and relationships. Yet this information is vital if the taxonomist is to make the best use of the chemical data now available to him. Of course, the organic chemist has all the background training necessary to understand this, but all too frequently considers taxonomy as a discipline essentially devoid of research and principally a matter of 'getting your names right.' The laborious collection and sifting of data, the experience and art of taxonomic judgement and significance of nomenclature, seem not to be understood. Indeed, if this were not the case, there would be far fewer papers in organic chemistry journals purporting to show taxonomic relationships, based on the distribution of one or a few inadequately sampled chemicals. Any book on chemical taxonomy must therefore try and bridge the gap between chemistry and taxonomy and attempt to educate both taxonomists and chemists at the same time. Philip Smith's 'Chemotaxonomy of Plants', though written primarily for the biology undergraduate succeeds in this task very well indeed.

The first three chapters set out to introduce the taxonomist to chemistry and chemotaxonomic investigation and he includes a very interesting chapter on the origins of

* The Chemotaxonomy of Plants by P. M. Smith. Contemporary Biology Series published by Edward Arnold Ltd. 1976. 313 pages. £13 hardback, £6.50 paper.

chemical taxonomy, right back to the probable knowledge of medicinal and poisonous plants held by early man. The technical difficulties and some of the skills required in actually obtaining the data for analysis have at last been brought to taxonomists' attention. There is adequate cross-reference to standard taxonomic literature and explanation of many frequently used taxonomic terms, for the chemist has to learn, too. My only cause for concern is that the use of the term homology, which has been used in different ways in the book (chemical, serological and taxonomic), has been inadequately explained.

The 'meat' of the book is contained in the middle nine chapters with the general heading of 'Sources of evidence'. Taxonomic 'evidence' is taken from a very wide range of micromolecules—fats, essential oils, phenolics, alkaloids, amino acids—and proteins and nucleotides. The emphasis here has rather heavily fallen on to proteins and serology, which is Dr Smith's own particular interest. This, perhaps, is natural enough, but the chapters on phenolics (which have probably been the most popular source of all chemical information and certainly about which most is known from the taxonomic viewpoint) and essential oils are too short. Phenolics and essential oils are represented by 16 and 21 pages respectively, compared with the 50 pages devoted to proteins and serology.

The last part of the book contains a chapter on the application of chemistry to the taxonomy of bacteria and two very good chapters on 'macromolecules and phylogeny' and 'chemical evidence and taxonomic problems'. The real difficulties faced by taxonomists in handling chemical data which conflict with existing classifications, the value of chemical criteria at all levels of the taxonomic hierarchy and the significance of chemical information in understanding the relationships and origins of infraspecific taxa are all excellently treated. The chapter on 'macromolecules and phylogeny' contains a clear account of the possibility of reconstructing phylogenetic trees by use of amino acid sequence information from one or two widely occurring proteins. These last two chapters should be prescribed reading for all undergraduate botanists and taxonomists alike.

With 514 references there is access to a great range of information, and it is certainly not confined to recent and obscure papers on chemical taxonomy. The chemist can work his way from Nehemiah Grew (1673) through de Candolle (1804), Darwin (1859) and Engler (1926), to Cronquist (1968) and Takhtajan (1969). This, therefore, is of tremendous value in bridging the difficult literature gap between the taxonomist and the organic chemist. A few omissions seem worth noting, like the shortage of references to the work of Swain and his associates. This is particularly disappointing since Swain is one of a group of chemists with real biological insight who has turned from his original field of research to chemical taxonomy.

But this is a successful and very welcome book, and fills a real gap. Taxonomists and organic chemists interested in chemical taxonomy will find this book a frequent source of reference. It is, however, designed particularly for undergraduates. University taxonomic courses, where they exist, still continue to occupy only a specialist role in biology degrees. Fortunately chemical taxonomy is currently an exciting branch of the discipline, so perhaps a good many students will discover and read this book. How many will buy it at £13 (£6.50 paper) is quite another matter.

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