All-*cis* 5,11,14-20:3 Acid: Podocarpic Acid or Sciadonic Acid?

Sir:

The first structural elements characteristic of the Δ5-unsaturated polymethylene-interrupted fatty acid (Δ5-UPIFA) 5,11,14-20:3 acid that may occur in some vegetable oils were published in 1957 (1,2). The starting materials were tall oil or pine (likely *Pinus sylvestris*) wood extracts (1) and the seed lipids of *Podocarpus nagi* Zoll et Moritzi (2). The trivial name "podocarpic" acid was then suggested (2). In 1963, the full structure of 5,11,14-20:3 acid was definitively established in Finnish tall oil, fresh pine wood, and pine seeds (3), *P. nagi* seed oil (4,5), and *Ginkgo biloba* leaves and nuts (6). A footnote in one paper (4) reporting on this acid indicated that "the eicosatrienoic acid of Nagi seed oil was carelessly named 'podocarpic acid' . . . but this nomenclature should be withdrawn since the same name had already been given to a different resin acid."

Recently (7), the name "podocarpic" acid has surfaced to describe the 5,11,14-20:3 acid, although in the meantime the name "sciadonic" acid was suggested as a replacement for "podocarpic" acid (8). Also, we recently reported in this journal on the fatty acid composition of the seed oil from two "*Podocarpus*" species, *P. nagi* and *P. andinus* (9,10). Species names were those used by major tree-seed sellers in their price lists, and for the former species, it corresponded (as well as the seed fatty acid composition) to the name employed by other authors in earlier studies (2,4,5,11). According to the recently published *World Checklist and Bibliography of Conifers* (12) (not available at the time we submitted Refs. 9 and 10 for publication), none of the above-mentioned species belong to the *Podocarpus* genus. Both *P. nagi* and *P. andinus* would thus be incorrect synonyms not retained as official names. Accepted names should be *Nageia nagi* Thunb. and *Prumnopitys andina* Poepp. ex Endl., respectively, thus corresponding to two distinct genera, different from the *Podocarpus* genus.

A single *Podocarpus* species, however, namely *P. macrophyllus* [reported as *P. macrophylla* (11)], was described in 1982 with regard to its seed fatty acid composition; a content of 9.7% 5,11,14-20:3 acid in neutral lipids was reported. Unpublished data from this Institute on the seed total lipids from the same species and from *Podocarpus elatus* indicate that 5,11,14-20:3 acid is not particularly abundant in these *Podocarpus* species; 8.1 and 2.2% of total fatty acids, respectively. Such values are commonly found in the seed lipids from many other Coniferophytes (9–11,13,14) and some Cycadophytes (Wolff, R.L., W.W. Christie, F. Pédrono, A.M. Marpeau, N. Tsevegsüren, K. Aitzetmüller, and F.D. Gunstone, unpublished data). Consequently, the name "podocarpic" acid does not relate particularly to the genus *Podocarpus*.

On the other hand, "sciadonic" acid seems appropriate for 5,11,14-20:3 acid, as it is the major Δ5-UPIFA in *Sciadopitys verticillata* seed lipids (8,10,11,13,14). This species was formerly classified in the Taxodiaceae family (15), while it is now increasingly recognized as the sole extant species of the monotypic Sciadopityaceae family (12,16). Interestingly, this taxonomic distinction is supported by the unique fatty acid composition of *S. verticillata* seeds among Coniferophytes that distinguishes this species from both the Cupressaceae and the Taxodiaceae families (14,17). Incidentally, some authors (12,16) suggest a merger of the Taxodiaceae and Cupressaceae families, a possibility also sustained by multivariate analyses of the seed fatty acid compositions of species from these two groups (14). The most intriguing feature of sciadonic acid is that it occurs (along with minor amounts of 5,11-20:2 and 11,14-20:2 acids) in the seed lipids of all Gymnosperm species containing Δ5-UPIFA analyzed so far, whereas other common Δ5-UPIFA such as pinolenic (5,9,12-18:3) and juniperonic (5,11,14,17-20:4) acids, for example, are each restricted to certain families and seldom occur together, at least in comparable amounts. Also, the 5,11,14-20:3 acid is a component of some rare Angiosperm species, and it naturally occurs as a minor lipid component in many animals.

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