LETTER TO THE EDITOR

Chemotaxonomic Approach Protects Against Mistakes in Polyunsaturated Fatty Acid Analyses in Plants

Sir,

Recently your Journal published a paper on fatty acids (FAs) in purslane (1) that attracted our attention. In the course of FA investigations of marine macrophytes, we came to the conclusion that different plant taxons have characteristic FA compositions (2,3), although we recognize that the relationship between FA composition and the taxonomic position of a plant may be complex (4). Of course, it has been established for some time that FAs are chemotaxonomic markers for plants. For example, arachidonic (AA) and eicosapentaenoic (EPA) acids are components of lower, nonflowering plants (5). However, this principle often is ignored by some lipidologists. Earlier we reported that we had found AA, EPA and docosahexaenoic acid in the seagrass *Zostera marina* (2), and later taxonomic considerations led us to recheck our results. Indeed, we discovered that *Z. marina* does not contain C_{20} and C_{22} polyunsaturated FAs (6).

Based on our experience, we believe that the finding of C_{20} and C_{22} polyunsaturated FAs in purslane (*Portulaca oleracea*) (1) was a mistake. To check this postulation experimentally, we collected a sample of *P. oleracea*, which grows in our area as a weed. Lipids were extracted and FAs were analyzed by gas-liquid chromatography as described (6). The results are shown in Table 1. Table 1 also gives FA composition data for purslane as calculated from the results of two earlier publications (1,7).

Although we detected dozens of minor FAs in the purslane, those FAs given in Table 1 amounted to more than 90% of total FAs. Simopoulos *et al.* (7) found that they amounted to 75% of the total FAs. In Omara-Alwala *et al.* (1), information is restricted to selected FAs only, and real contents of the FAs are 10–25% lower than given in Table 1. However, that does not alter the principle of this debate. We confirmed the high level of linolenic acid in purslane, but we could not find any evidence for C_{20} and C_{22} ω-3 FAs. These are essentially the same results as were obtained by Simopoulos *et al.* (7).

In the modern literature one can find other examples of data on polyunsaturated FAs that create doubt because of chemotaxonomic considerations. For example, levels of such FAs in marine algae must be much higher than reported (8). Therefore, we decided this letter would be a useful contribution to your journal.

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TABLE 1

Composition of Selected Fatty Acids in Purslane (*Portulaca oleracea*) as Determined by Different Authors (% of total FA)[a]

Fatty acid	Omara-Alwala *et al.* (1)			Our results		Simopoulos *et al.* (7)
	Leaf	Stem	Whole plant	Leaf	Stem	Whole plant
16:0	15.3–17.9	45.5–64.9	18.7–45.5	12.9	20.3	9.5
18:0	1.1–3.6	trace–< 0.1	2.6–4.0	1.1	2.7	2.3
18:1ω9	1.4–3.6	trace–< 0.1	2.6–6.8	4.6	7.8	5.1
18:2ω6	9.3–12.6	5.4–19.3	9.0–13.8	10.6	33.3	10.5
18:3ω3	41.4–66.4	2.4–5.9	28.4–42.5	62.9	30.2	47.6
20:5ω3	0.8–12.6	18.6–35.5	6.4–21.5	—	—	0.1
22:5ω3	1.4–3.3	trace	1.0–3.0	—	—	
22:6ω3	0.3–6.4	trace	0.6–5.6	—	—	

[a]Results from refs. (1) and (7) expressed as mg of FA per kg or g of wet weight were recalculated. As in ref. (1), FA composition was determined for plants of three different ages, we give the lowest and the highest values for different plan parts.

NOTE

With the above Letter to the Editor we will stop printing correspondence related to the alleged misidentification of polyunsaturated C_{20} and C_{22} fatty acids in purslane (*Portulaca oleracea*).

L.H. Princen
Editor