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# Datasheet for the decision of 16 July 2013

**Case Number:** T 1966/11 - 3.3.09

**Application Number:** 06837942.9

**Publication Number:** 1959760

**IPC:** A23L 1/236, A23L 1/30, A23L 1/305, A23L 1/308, A61K 38/01, A61P 3/04

**Language of the proceedings:** EN

**Title of invention:**
High-potency sweetener for weight management and compositions sweetened therewith

**Applicant:**
The Coca-Cola Company

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 56

**Keyword:**
"Inventive step: yes - unexpected improvement"

**Decisions cited:**
T 1964/11

**Catchword:**
-

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**Case Number:** T 1966/11 - 3.3.09

# D E C I S I O N
**of the Technical Board of Appeal 3.3.09**
**of 16 July 2013**

**Appellant:** (Applicant)
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 28 April 2011 refusing European patent application No. 06837942.9 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman:** W. Sieber
**Members:** J. Jardón Álvarez
F. Blumer

## Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division posted on 28 April 2011 refusing European patent application No. 06 837 942.9.

The decision was based on a main and a first auxiliary request filed on 28 February 2011.

Claim 1 of the main request read as follows:

"1. A functional sweetener composition comprising at least one weight management agent, a rebaudioside A and a sweet taste improving polyol additive."

The examining division held that the subject-matter of claim 1 of the main request lacked inventive step in view of the disclosure of any of D10, D11 or D12 considered alone and that the claims of the first auxiliary request did not meet the requirements of Article 123(2) EPC.

D10: JP 2003 180288 (English abstract);

D11: JP 2004 073197 A (English abstract); and

D12: JP 2000 236842 A (English abstract).

II. On 8 June 2011 the applicant (in the following: the appellant) filed a notice of appeal and on the same day paid the appeal fee. On 23 August 2011 the appellant filed the statement setting out the grounds of appeal including a new main request and the following documents:

D12': Full-text English translation of D12;

D13: Reference to comparative data in WO 2007/061795 A1 (pages 108 to 110 and 205 to 208); and

D14: I. Prakash *et al.*, "Development of rebiana, a natural, non-caloric sweetener", Food and Chemical Toxicology, 46, (2008), pages S75 to S82.

[D13, a parallel application of the same corporate applicant, was referred to by the appellant to support its inventive step arguments.]

III. On 8 February 2013 the board dispatched a summons to oral proceedings. In the annexed communication the board indicated the points to be discussed during the oral proceedings.

IV. With its letter dated 13 June 2013, the appellant filed a main and an auxiliary request to replace its previous request and submitted further arguments in support of inventive step.

V. On 16 July 2013 the appellant withdrew the request for oral proceedings and filed a new main request.

Claim 1 of the main request reads as follows:

"1. A functional sweetener composition comprising at least one functional ingredient, rebaudioside A having a purity of 50% to 100% rebaudioside A by weight on a dry basis and erythritol, wherein:

the rebaudioside A is present in an amount ranging from 100 ppm to 3,000 ppm of the functional sweetener composition;

the erythritol is present in an amount ranging from 5,000 ppm to 40,000 ppm of the functional sweetener composition; and

the at least one functional ingredient comprises at least one weight management agent."

Claim 2 is directed to a functional sweetened composition comprising the components as set out in claim 1; claim 3 is directed to a method for imparting a more sugar-like temporal/flavour profile to a functional sweetener/sweetened composition by using the components as set out in claim 1; claims 4 to 6 are dependent claims and claim 7 is directed to a functional beverage comprising the functional sweetener composition of claim 1.

VI. On 16 July 2013 oral proceedings were held before the board in the absence of the appellant.

VII. The relevant arguments presented by the appellant may be summarised as follows:

- The claims of the present request were based on a similar combination of features as the claims of the second auxiliary request in the parallel case EP 06 837 845.4 (T 1964/11). The allowability under Article 123(2) EPC for such claims had been acknowledged by the examining division. Claim 1 had been further amended to specify the purity of rebaudioside A in accordance with the disclosure in

the second paragraph of page 15 of the application as filed.

– Concerning inventive step, the appellant saw the teaching of D12 as representing the closest prior art document. Documents D10 and D11 failed to disclose rebaudioside A. The objective technical problem underlying the invention was the provision of a functional sweetener composition having a more sugar-like temporal/flavour profile overcoming the prior-art drawbacks of unpleasant aftertaste (bitterness and sweetness linger). The solution according to claim 1 resulted in a sweetener composition with superior taste properties as demonstrated by the new experimental evidence. Taking account of the unpredictability in the sweetener art, the skilled person could not have foreseen that the claimed sweetener compositions would provide the desired flavour and/or taste profile.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request (claims 1 to 7) as filed with letter dated 16 July 2013, or, alternatively, on the basis of the auxiliary request (claims 1 to 11) as filed with letter dated 13 June 2013.

## Reasons for the Decision

1. The appeal is admissible.

MAIN REQUEST

2. *Amendments*

2.1 Claim 1 is directed to the functional sweetener composition of claim 1 as originally filed wherein:

- the "at least one-high potency sweetener" has been limited to rebaudioside A (supported, for instance, by claim 15 and page 13, line 9); and

- the "at least one sweet taste improving composition" has been limited to erythritol (supported, for instance, by claim 17 and page 26, line 2).

It has been further limited to the preferred embodiment disclosed on page 92, lines 21 to 24, namely that rebaudioside A is present in an amount from 100 ppm to 3,000 ppm and erythritol in an amount from 5,000 ppm to 40,000 ppm. Finally, it has been specified that the rebaudioside A has "a purity of 50% to 100% by weight on a dry basis" as disclosed in the second paragraph of page 15 of the application as filed. It is clear that the purity referred in this passage applies to particular embodiments, i.e. also the embodiment of page 92 (see also page 92, line 16).

2.2 Claims 2 and 3 are respectively based on claim 42 as filed and on the disclosure of page 3, lines 21 to 22 as filed, including the amendments made to claim 1.

2.3 Claim 4 finds support on page 15, lines 14 to 17 and claim 5 on page 92, lines 24 to 27.

2.4 Finally, claim 6 incorporates the substances recited in claims 2 to 8 as filed and claim 7 is based on the disclosure of claims 84 to 98 as filed.

2.5 Thus, the amendments are supported by the application as filed and fulfil the requirements of Article 123(2) EPC.

3. *Inventive step*

3.1 The application relates to a sweetener composition comprising a non-caloric high-potency sweetener, namely rebaudioside A, and a carbohydrate sweetener, namely erythritol, to improve the taste of ingestible compositions.

3.2 The use of high-potency sweeteners to replace natural sweeteners such as sucrose is already known. Sweetener compositions comprising a sweetener of high sweetness and a sugar alcohol are also disclosed in the prior-art documents D10, D11 and D12 cited in the appealed decision.

3.3 The board agrees with the appellant that document D12 represents the closest prior art, essentially because it is the only document relating to rebaudioside A.

Rebaudioside A presents, like other high-potency sweeteners, a taste problem that limits its use: it has an unpleasant "aftertaste" or, more specifically, a

bitterness and sweetness linger worse than other known sugar substitutes, including sucralose and aspartame.

3.4 D12 aims to provide a stevia sweetener wherein the bitter and sweet aftertaste of stevia sweeteners is improved. Specifically, D12 teaches that the taste properties of α-glucosylated steviol glycoside sweeteners can be improved by purifying the stevia-extract starting material to contain a high (>90%) rebaudioside A concentration followed by enzymatic modification to produce functionalised α-glucosylated steviol glycosides, which are then combined with a polyol such as erythritol to produce a more complex synthetic sweetener composition with fewer taste problems due to the stevia extract starting material (see paragraphs [0011] to [0014] and [0042] of D12').

3.5 According to the appellant the problem to be solved by the application in view of this prior art can be seen in the provision of a further sweetener composition having an improved, more sugar-like temporal/flavour profile (cf. page 3, line 20 to page 4, line 2 of the description). In particular, the application aims to provide compositions having improved taste properties such as decreased unpleasant bitterness and sweetness linger.

3.6 As a solution to this problem the application proposes the compositions of claim 1 comprising rebaudioside A in combination with erythritol in the amounts specified therein.

3.7 The appellant has referred to experimental evidence (D13) in the grounds of appeal to show that erythritol

at the claimed amounts is necessary to modulate the flavour and temporal profile of rebaudioside A to obtain a sweetener composition with reduced aftertaste.

3.8 These experiments show that the claimed compositions provide superior taste properties over compositions containing only rebaudioside A.

3.8.1 In particular, it was found that a control sample containing sucrose had a sweetness linger of 0 (no sweetness linger) whereas a sample containing rebaudioside A in a quantity to give the equivalent sweetness had a sweetness linger of 5 (high sweetness linger). The addition of erythritol to rebaudioside A gave a sweetened composition having a sweetness linger of 1 (D13, Example B1), showing that the incorporation of erythritol decreased the sweetness linger of rebaudioside A from high to very low.

3.8.2 Moreover, comparative taste tests of certain sweetened compositions comprising rebaudioside A, erythritol and certain additional sweet taste-improving compositions exhibit less sweetness linger than compositions comprising just rebaudioside A and the sweet taste-improving composition (*i.e.* in the absence of erythritol), as shown in the following examples of D13:

- Example F132 describes that a sweetened composition containing rebaudioside A, sucrose, erythritol and D-tagatose had a sweetness linger of 0. In contrast, Example Fl33 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example Fl34 describes that a sweetened composition containing sucrose, erythritol and D-tagatose had a sweetness linger of 1. In contrast, Example Fl35 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example F136 describes that a sweetened composition containing rebaudioside A, sucrose and erythritol had a sweetness linger of 0. Example Fl37 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example F142 describes that a sweetened composition containing rebaudioside A, erythritol, fructose, KCl and $KH_2P0_4$ had a sweetness linger of 2. Example F143 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

- Example F144 describes that a sweetened composition containing rebaudioside A, erythritol and gum acacia Senegal had a sweetness linger of 2. Example F145 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

- Example F146 describes that a sample containing rebaudioside A, erythritol, glycine, KCl, $KH_2P0_4$ and D-alanine had a sweetness linger of 1. Example Fl47 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

3.8.3 Finally, concerning examples H37 to H41 in the present application which disclose compositions falling within the scope of claim 1 but having a rather high sweetness linger, the appellant stated during the oral

proceedings in the parallel case T 1964/11 that the same compositions without erythritol showed still higher sweetness linger. Consequently, H37 to H41 do not cast doubts on whether the alleged effect associated with the combination of rebaudioside A and erythritol is achieved.

3.8.4 In view of these results, the board is satisfied that the above technical problem is solved by the claimed combination of rebaudioside A and erythritol.

3.9 It remains to be decided whether, in view of the available prior-art documents, it would have been obvious for the skilled person to solve this problem by the means claimed.

3.9.1 Document D12 itself does not provide any hint to the claimed invention. In fact D12 teaches away from sweetened compositions comprising rebaudioside A. As indicated in point 3.4 above, D12 teaches that, to produce a sweetener product with an acceptable sweet-taste profile, rebaudioside A must be enzymatically modified by α-glucosylation to produce an α-glucosylated steviol glycoside and then combined with a polyol. If it had been obvious that the aftertaste of rebaudioside A could be modified by combining it with erythritol, the inventors of D12 would not have glycosylated the rebaudioside A before combining it with erythritol. Moreover, D12 also shows that not every combination of erythritol and a high-potency sweetener improves the aftertaste derived from the sweetener (see [0008]), confirming the arguments of the appellant concerning unpredictability in the sweetener field.

3.9.2 Documents D10 and D11 likewise do not suggest adding erythritol to rebaudioside A to solve the above problem.

3.9.3 D10 is directed to solving the bitter taste and sweet aftertaste of high-potency sweeteners and/or sugar alcohols in compositions by combining them with enzymatically treated gingko-leaf extract.
D10 discloses, among other high-potency sweeteners, stevia which is a complex mixture including stevioside, rebaudiosides A, B, C, D, E and F, etc., each having distinct chemical structures and taste properties. Stevia is not equivalent to rebaudioside A and, as would be understood by the skilled person, the particular properties of one sweetener cannot be transferred to another.

3.9.4 D11 is directed to improving sweetness linger and texture problems associated with certain sweetener compositions by the addition of L-arabinose. It discloses stevia and stevioside, among other high-potency sweeteners. The compositions may also comprise sugar alcohols, including erythritol. However, D11 does not teach or suggest the combination of erythritol with rebaudioside A, which is not even mentioned in D11.

3.9.5 In D10 and D11 the combination of a sugar alcohol and a high-potency sweetener is only optional. Faced with the technical problem identified above, the skilled person could not have deduced from these documents that the combination of rebaudioside A and erythritol would yield a sweetener composition with improved taste properties.

3.10 The examining division denied an inventive step essentially because the application did not provide any unexpected effect linked to the claimed sweeteners.

As set out above, this argument no longer applies in view of the experimental evidence filed during the appeal proceedings.

3.11 For these reasons, the board considers that the subject-matter of claim 1 and, by the same token, of claims 2 to 7 (see above point V) involves an inventive step within the meaning of Article 56 EPC.

4. As the main request is allowable, there is no need for the board to deal with the auxiliary request.

## Order

**For these reasons it is decided that:**

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of the main request (claims 1 to 7) as filed with letter dated 16 July 2013 and a description/figures to be adapted.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber