Are Jaffa Cakes really biscuits?

The affinities of Jaffa Cakes: Using cladistics to classify biscuits

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Abstract
A classification of biscuits is proposed, based on a scientifically sound cladistic methodology. The most important factor in the broad classification of biscuits is their shape, not the presence or absence of a chocolate coating, as endorsed by previous classifications. Of perhaps the greatest significance in this analysis is the unexpected confirmation that in a simple dichotomising classification of cakes and biscuits, the Jaffa Cake is a biscuit. As a logical solution, these results suggest that the implementation of a three-way classification is necessary, including a new group of biscuit-cake intermediates, the pseudobiscuits. This study may have much significance in our every day lives, not only because of the novel terminology, but also because of the link between government food classification and tax brackets.

Introduction

When Carolus Linnaeus first devised his classification of life in 1735, there was no underlying phylogenetic justification. His system, like all classifications biological or otherwise was ultimately a utilitarian tool - simply put, a classification of life should be useful (Benton, 2000). It is from this viewpoint, that I came to construct a concise classification of another group of disparate objects, albeit a little less diverse than life itself - the biscuits. Biscuits are not the first inanimate objects to be subjected to taxonomic analysis. Mobile phones (Hall 2004) and volcanoes (Hone *et al.* in prep) are other examples. Cladistics has also been applied to those idiosyncratic cartoon characters, the Mr Men (Braddy *pers. comm.* 2003).

Aims of the paper

The only other classification of biscuits, I am aware of, is given by Nicey and Wifey (2004a). The scheme is constructed using simple phenetics. Although the detailed interrelationships are not discussed, they give two broad types of biscuits: [plain] biscuits and chocolate biscuits. These are each subdivided into three smaller groups: entry level, midrange, and luxury. These categories represent the increasingly complicated form and constitution of the biscuits. This paper aims to test this taxonomic hypothesis using cladistic methods, whilst illustrating the potential of this method for constructing other classifications of everyday objects.

Materials and Methods

A cladistic analysis was performed to ascertain a scientifically valid and robust classification of biscuits. A data matrix composed of 20 morphological characters (Appendix 1) and 20 biscuits and biscuit-like snacks, was run through the computer program PAUP (phylogenetic analysis using pastries?) (Swofford, 2000; Heuristic search, 1000 random replicates). The simple sponge cake was chosen as a conservative outgroup and used to determine the polarity of the characters. The resulting strict consensus tree is depicted in Figure 1.

Discussion

Pseudobiscuits

The Jaffa Cake has long been a disputed member of the biscuit Order (Pootle, 2004). In his report "*Jaffa Cakes are Cakes - Proof from the Courtroom*", Archibald (2004) describes a courtroom battle and the various evidences, leading to the decision of the British Government to classify the Jaffa Cakes as a cake, immunising Jaffa Cakes from VAT. Nicey and Wifey (2004b) leave no doubt that the Jaffa is clearly a cake; the following response is given on their website (Nicey and Wifey 2004a), to the frequently asked question: "Are Jaffa Cakes biscuits?"

"No, no they're not. Apart from being called cakes they obviously have a sponge base. Granted they *appear* to be some kind of luxury biscuit being chocolate covered and shipping in a box." [italics added].

The argument that the word 'cake' appears in the name is a simple issue of semantics. Using this logic one may argue that shortcake is a cake. Objects are classified based on their appearance. According to the current analysis using parsimony, if the Jaffa Cake *IS* indeed a cake, then so are Fig Rolls and Jammie Dodgers (an unarguable situation). This is because these two biscuits show closer affinities with the Jaffa Cake than with any other biscuits. So according to this classification, the Jaffa cake *IS* a biscuit after all. It therefore seems there is no simple dichotomy between cakes and biscuits. However, it is possible to make a compromise between a biscuit and cake affinity for Jaffa cakes, by allocating this group a new name. I propose the name 'Pseudobiscuits' for this clade of three genera, on account of their close kinship with both cakes and biscuits. All other biscuits, can be referred to as 'True biscuits'.

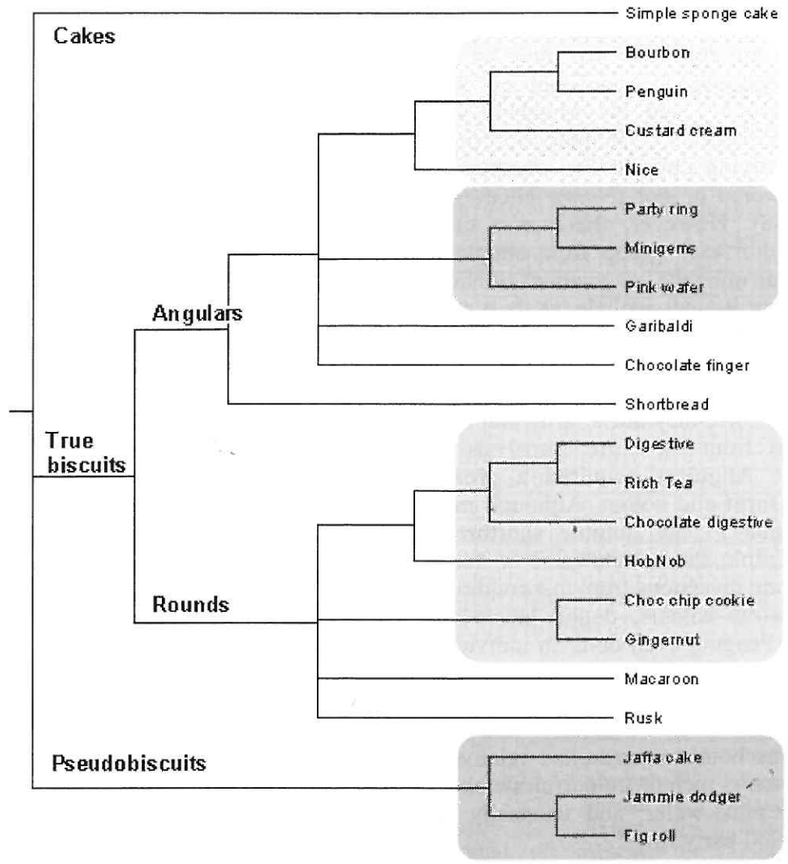

Figure 1. Cladogram of the biscuit family - which is your favourite?

True biscuits

True biscuits are split into two more or less equal sized groups, distinguished by their shape: The Rounds and the Angulars. This indicates that shape is a far more significant factor in classifying a biscuit than whether it is chocolate covered or not (*contra* Nicey and Wifey, 2004a). However, there is a clear transition within each group from simple to complex, confirming the observations of Nicey and Wifey. The Rounds include, as their most simple members, the rusk and similar forms. This group culminates in the well-known dunking forms. Although double-layered Rounds are known, they are a rarity and have been omitted from the current analysis. In contrast, the Angulars acquired a greater variation in form and colour. Although most Angulars, such as the humble shortbread, retained a simple flat structure, some forms exhibit extreme diversions from this condition, exhibiting exotic colours, double-layers and fillings. The Penguin even dons an individual waterproof wrapping. These Angulars can be further subdivided into the families Partydae (the children's party biscuits) and the Bourbidae (the bourbons and close relatives). The party biscuits include colourful members, such as the pink wafer, and unusually for Angulars, round party rings.

The Future

Future cladistic analyses should include many more genera of biscuits, and more cakes, to confirm a comprehensive classification. Biscuits have a temporal duration and origin, and it would be interesting to see if there are any evolutionary patterns to the origin of biscuits; there may even be a link between the evolution of dinosaurs and biscuits, as suggested by Smith (2004). There are obviously other ways of classifying biscuits, such as their respective ingredients, but what this study shows, is that it is possible to approach a classification from a more-or-less objective, rather than subjective standpoint. Perhaps the governments should take note of this when applying controversial foods, such as Jaffa Cakes, to tax brackets. Unfortunately, perhaps they would be successful in their next attempt to add biscuit tax to the Jaffa cake. If so, then…sorry folks!

Conclusion

A cladistic analysis of biscuits shows that the biscuits can be classified as follows:

Pseudobiscuits: Jaffa Cake, Fig Roll, Jammie Dodger.
True biscuits:
- > **Rounds**: Digestive, Chocolate Digestive, Rich tea, HobNob, Choc Chip Cookie, Macaroon, Rusk, Gingernut.
- > **Angulars**: Shortbread, Chocolate finger, Garibaldi.
  - >> ***Bourbidae***: Bourbon, Penguin, Custard Cream, Nice.
  - >> ***Partydae***: Party ring, Minigems, Pink wafer.

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Appendix 1. Data matrix with characters, character descriptions and character states below

Genus/Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Simple sponge cake	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Bourbon	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0
Digestive	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Chocolate digestive	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Rich tea	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Penguin	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0
Custard cream	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
Party ring	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0
Hobnob	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Jaffa Cake	0	0	0	1	1	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0
Choc chip cookie	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Nice	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Jammie Dodger	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0
Fig Roll	1	1	0	0	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0
Minigems	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0
Pink wafer	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Shortbread	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Garibaldi	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Chocolate finger	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macaroon	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0
Rusk	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Gingernut	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0

1. Round/angular outline.	Round = 0,	Angular = 1.
2. Single/double layer.	Single = 0,	Double = 1.
3. Colour pale/dark.	Pale = 0,	Dark = 1.
4. Chocolate covering.	Absent = 0,	Present = 1.
5. Filling.	Absent = 0,	Present = 1.
6. Smooth/rough (internal texture).	Smooth = 0,	Rough = 1.
7. Fruit element (in any form).	Absent = 0,	Present = 1.
8. Internal fenestra (hole in the middle e.g. party ring).	Absent = 0,	Present = 1.
9. Psychodelic (pink or other bright colour).	Absent = 0,	Present = 1.
10. Individually wrapped.	Absent = 0,	Present = 1.
11. Dimples. (distinct rows of dimples e.g. Bourbon).	Absent = 0,	Present = 1.
12. Text.	Absent = 0,	Present = 1.
13. Thickness.	Thin = 0,	Thick = 1.
14. Scenic surface.	Smooth = 0,	Rugged = 1.
15. Soft and spongy/crunchy.	Soft = 0,	Crunchy = 1.
16. Chocolate biscuit.	Absent = 0,	Present = 1.
17. Fruit filling (must be a filling, not isolated elements).	Absent = 0,	Present = 1.
18. Cream filling.	Absent = 0,	Present = 1.
19. Exotic/luxury element.	Absent = 0,	Present = 1.
20. Disc-like (very wide and flat e.g. round rich tea).	Absent = 0,	Present = 1.