

# Journal of Interdisciplinary Science Topics

---

## A detailed consideration of the mechanism and events surrounding Oompa-Loompa speciation

Sarah Hume

*Natural Sciences (Life and Physical Sciences), School of Biological Sciences, University of Leicester*  
16/03/2022

### Abstract

Previous work established Willy Wonka's factory workers, the Oompa-Loompas, as a distinct hominin species. The events surrounding the speciation of *Homo loompis* are investigated here, with key consideration given to evidence for a peripatric (founder population) speciation. There is significant support for Oompa-Loompas having undergone a prolonged period of isolation. Their exact placement in the hominin clade is then considered, with a determination that despite physical differences, mainly stature, Oompa-Loompas may be our closest relatives.

**Keywords:** *Film; Book; Biology; Genetics; Charlie and the Chocolate Factory; Oompa-Loompa*

---

### Introduction

This paper intends to expand on the work of a previous paper '*Homo loompis: are Oompa-Loompas a distinct hominin species?*' [1]. Where the purpose of that paper was, as the title suggests, a determination of whether Oompa-Loompas are hominins and if so, could they, under any species concept, be considered a species in their own right, from the limited evidence available to us from the films and books. That work ended with the conclusion that under the phenetic and likely even biological species concepts, Oompa-Loompas can be considered a distinct species.

Here, we explore the details surrounding the purported speciation. First, a focus on the mechanism and isolated context which would have facilitated speciation and then evidence for how closely related *Homo loompis* may be to modern humans.

### Founder population

In the previous paper peripatric speciation as a result of a founder event is suggested as a possible mechanism for speciation [1]. Here, we explore this idea in more detail.

In peripatric speciation, a population becomes separated from the main genepool and the prolonged isolation leads to divergence between the two groups, eventually resulting in separate species [2]. In

this case this is suggested to be a result of dispersal. Oompa-Loompas come from Loompaland (a region on the island of Loompa). The general public are unaware of their existence, and this supports the idea there is no gene flow with anyone from outside the island i.e., a closed population.

The founder population model is also supported by their lack of phenotypic variation. Although their appearance varies between source material, *within* each adaptation the Oompa-Loompas have a consistent and distinct appearance. If a group of our LCA (last common ancestor) had somehow made it to the island there would within that group exist only a fraction of the variation which exists in the parental population [3]. This means there is less initial variation for natural selection to act on (less evolutionary potential) and as the whole population live in one environment there is only one ecological niche for them to adapt to. I.e., the entire population is under the same selection pressures which promotes homogenisation [4]. Over time a smaller population such as this is also more susceptible to the effects of genetic drift – that is stochastic events that lead to the loss or fixation of alleles, once again leading to a more homogenous population [4].

### Endemism and coevolution

During the 2005 film, Willy Wonka tells the winners of the five golden tickets the following about Loompaland:

*“...[it is] infested by the most dangerous beasts in the entire world, hornswogglers and snozzwangers, and those terrible wicked wangdoodles [...] They [Oompa-Loompas] lived in treehouses to escape from the fierce creatures who lived below.”* [5]

This gives us two key pieces of information. First, that there are several species present on Loompaland which do not occur elsewhere i.e., there is a high level of endemism. Second, that the Oompa-Loompas are in some way predated by these species.

Endemism in general is highly, but not exclusively, associated with islands and can be viewed as an indicator of isolation [6]. This offers supplementary evidence that there is minimal geneflow between the island and other landmasses and supports our peripatric speciation model.

That the Oompa-Loompas have predator-prey dynamics with some of the fantastical animals mentioned previously suggests a level of coevolution. If there were no such dynamics this would suggest Oompa-Loompas had only recently (in evolutionary terms) arrived on the island. The escape from enemy hypothesis is often applied to invasive or range expanding species, when they flourish by virtue of a lack of natural predators (or enemies) in their new environment [7]. This is clearly not the case on the island of Loompa and the coevolution, especially with endemic species, suggests a prolonged period of isolation – perfect for peripatric speciation.

### Language capabilities

In the previous Oompa-Loompa speciation paper, *language* capabilities, such as those displayed during their infamous songs are used as key evidence for their sitting in the hominin clade [1].

In the 2005 film adaptation, Oompa-Loompish is shown to rely primarily on gestures with supporting vocalisations [5]. This shows that Oompa-Loompas use gestural communication significantly more than humans, and supports the idea that Oompa-Loompas underwent many of the same recent events (in

evolutionary terms) as humans, but that divergence has since occurred.

An area of the human frontal lobe, known as Broca’s area, is key to language processing and has also been found to be active during certain gestural storytelling [8]. It has been proposed that vocalisations initially supported gestures in communication surrounding food, and that the more speech dominated system evolved gradually from this [9, 10]. This theorised early style of communication is much more similar to what we see from the Oompa-Loompas. As we know that Oompa-Loompas can speak perfectly well in English, we know that the Broca’s area in their brains must have a high level of similarity to ours to have developed this complex capacity for spoken language. Due to our inability to determine if other hominin species had such an area in their brains (as we only have fossil evidence) [11], it is reasonable to suggest that *Homo loompis* is more closely related to anatomically modern humans than other hominins.

It is however important to note that sign language, even amongst people who share a spoken language, has been documented in indigenous communities in the US for hundreds of years [12]. However, the lack of any purely or primarily spoken language to accompany this within Oompa-Loompas (a hearing community) did appear to be unique from a search in the literature. This overlap in communication styles, even if it’s within a minority of the human population, gives further support to the idea that Oompa-Loompas may be the most closely related species (extant or extinct) to humans.

### Conclusion

Several pieces of evidence suggest a peripatric model of speciation for Oompa-Loompas. Some of this evidence (endemism, coevolution) is centred around an absence of geneflow as a result of a prolonged period of isolation from other hominins, thus excluding sympatric models. While a dispersal event in particular is supported by their low level of phenotypic variation – even in characteristics which cannot be presumed to have any form of selective advantage. While the competency of Oompa-Loompas in regards to language – both spoken and gestural, does not tell us anything about the mechanism surrounding their speciation, it does suggest that they may be our closest relatives.

## References

- [1] Hume, S. (2022) *Homo loompis*: are Oompa-Loompas a distinct hominin species?, *Journal of Interdisciplinary Science Topics*, 9.
- [2] Martin, E. and Hine, R. (2014) *A Dictionary of Biology*. 6th edn. Oxford: Oxford University Press.
- [3] Kivisild, T. (2013) *Brenner's Encyclopedia of Genetics (Second Edition)*, Elsevier, pp. 100-101.
- [4] Furlan, E., Stoklosa, J., Griffiths, J., Gust, N., Ellis, R., Huggins, R.M. and Weeks, A.R. (2012) *Small population size and extremely low levels of genetic diversity in island populations of the platypus, Ornithorhynchus anatinus*, *Ecology and Evolution*, 2(4), pp. 844-857. DOI: [10.1002/ece3.195](https://doi.org/10.1002/ece3.195)
- [5] Dahl, R. and August, J. (2005) *Charlie and Chocolate Factory*. [Film] Directed by Tim Burton. Warner Brothers Pictures. First released (UK) 9 July 2005.
- [6] Sandel, B., Weigelt, P., Kreft, H., Keppel, G., van der Sande, M.T., Levin, S., Smith, S., Craven, D., Knight, T.M. (2019) *Current climate, isolation and history drive global patterns of tree phylogenetic endemism*, *Global Ecology and Biogeography*, 29(1), pp.4-15. DOI: [10.1111/geb.13001](https://doi.org/10.1111/geb.13001)
- [7] Mlynarek, J.J., Moffats, C.E., Edwards, S., Einfeldt, A.L., Heustis, A., Johns, R., MacDonnell, M., Pureswaran, D.S., Quiring, D.T., Shibel, Z. and Heard, S.B. (2017) *Enemy escape: A general phenomenon in a fragmented literature?*, *FACETS*, 2(2), pp. 1015-1044. DOI: [10.1139/facets-2017-0041](https://doi.org/10.1139/facets-2017-0041)
- [8] Fadiga, L., Craighero, L., Destro, M.F., Finos, L., Cotillon-Williams, N., Smith, A.T. and Castiello, U. (2006) *Language in shadow*, *Social Neuroscience*, 1(2), pp. 77-89. DOI: [10.1080/17470910600976430](https://doi.org/10.1080/17470910600976430)
- [9] Gentilucci, M. and Dalla Volta, R. (2006) *Spoken language and arm gestures are controlled by the same motor control system*, *Quarterly Journal of Experimental Psychology*, 61(6), pp. 944-957. DOI: [10.1080/17470210701625683](https://doi.org/10.1080/17470210701625683)
- [10] Gentilucci, M. and Corballis, M.C. (2006) *From manual gesture to speech: a gradual transition*, *Neuroscience and Biobehavioral Reviews*, 30(7), pp. 949-960. DOI: [10.1016/j.neubiorev.2006.02.004](https://doi.org/10.1016/j.neubiorev.2006.02.004)
- [11] Beaudet, A. (2017) *The Emergence of Language in the Hominin Lineage: Perspectives from Fossil Endocasts*, *Frontiers in Human Neuroscience*, 11:427. DOI: [10.3389/fnhum.2017.00427](https://doi.org/10.3389/fnhum.2017.00427)
- [12] Carayon, C. (2016) *"The Gesture Speech of Mankind": Old and New Entanglements in the Histories of American Indian and European Sign Languages*, *The American Historical Review*, 121(2), pp. 461-491. DOI: [10.1093/ahr/121.2.461](https://doi.org/10.1093/ahr/121.2.461)