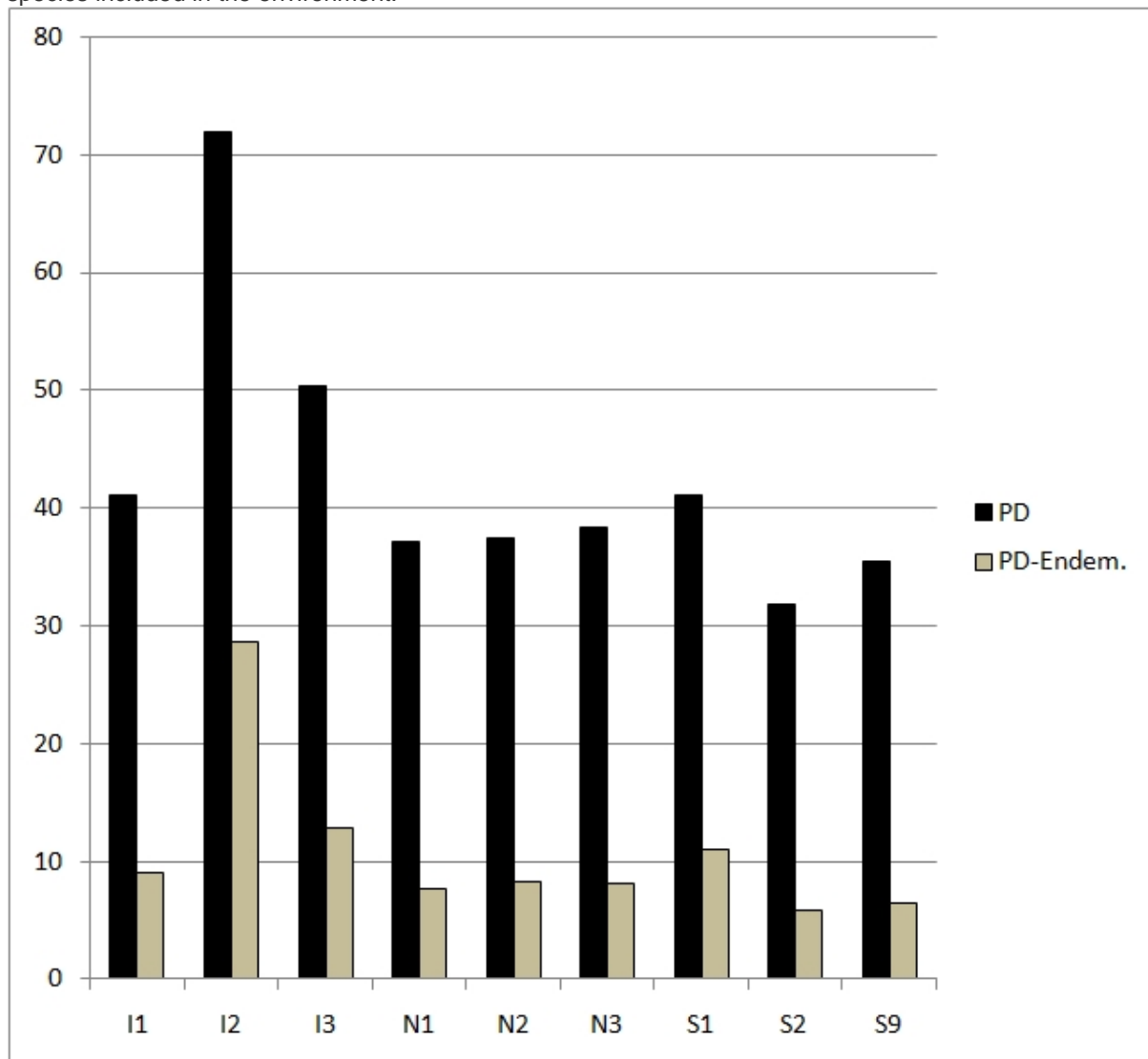


Smoking Cessation Induces Profound Changes in the Composition of the Intestinal Microbiota in Humans

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Figure S8. PD and PD-Endemism. There are substantially higher values in the intervention group after smoking cessation. PD-Endemism refers to the amount of branch length that is uniquely represented by a certain environment while PD is indicative of the total phylogenetic branch length, that is spanned by all species included in the environment.



Phylogenetic endemism

"Phylogenetic endemism" is the amount of evolutionary history uniquely represented in a given area or region.

Calculations of phylogenetic endemism based on PD calculations go back to Faith (1992), but good example calculations can be found in Faith et al (2004).

Faith DP, Reid CAM, Hunter J. Integrating Phylogenetic Diversity, Complementarity, and Endemism. *Conserv Biol.* 2004;18:255–261.

Faith et al (2004) describe a measure of phylogenetic endemism, or PD-endemism, this way:

The PD measure uses phylogenetic patterns of evolutionary diversification to predict feature diversity of sets of species. The total PD of a given set is the total phylogenetic branch length spanned (represented) by its member species. The PD complementarity of a species is measured by the additional branch length it represents that is not spanned by a reference set of species (Faith 1992a). When the reference set is all other species, the PD complementarity value is the unique PD contribution of that species; it can be thought of as “endemism” at the level of features-within-species (rather than species-within-areas).

A PD-based measure of endemism of areas (Faith 1992a; 1994b) results when the reference set corresponds to the set of species found in all other areas. It is the amount of branch length (PD) or “evolutionary history” (Faith 1994a) uniquely represented by the area. For example, the PD unique to northwest Tasmania has been estimated for a phylogeny of amphipods. PD-endemism, more than conventional species-level endemism, highlighted the potential conservation importance of that area (Faith 1994b; for another example, see Moritz & Faith, 1998).

Because PD implicitly counts unit features among sets of objects, it provides straight-forward notions of complementarity (number of additional units gained) and endemism (number of units uniquely contained) in the context of objects and sets. These sets may be defined by the species themselves, or by areas as collections of species. Indeed, PD complementarity and endemism can be applied when sets are defined in other ways. For example, we can talk about the PD-endemism of an ecotype (rather than area), as for *Acidobacterium* lineages that are found globally but may represent bacterial evolutionary history that is unique to an acidic ecotype (Wise et al. 1997; see also Radajewski et al. 2000).

At a large geographic scale, PD-endemism may highlight different areas compared to species-endemism, because divergence corresponding to, say, complete genera may be restricted to one area (as for orchids in Australia, Faith 1994b; for related discussion on PD, see Sechrest et al. 2002; Polasky et al. 2001; Rogrigues & Gaston 2002).

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