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Abstract: Mesoporous materials can be produced by simple procedures utilising the complex molecular architecture found in plants. Carbon-based mesoporous materials with tuneable surface and bulk properties can be synthesised by the low temperature carbonisation of expanded natural starches that are in turn prepared by a simple gelatinisation-retrogradation process. This not only provides an entirely new, and simpler and less wasteful route to nanostructured carbons but also enables direct and control of their bulk and surface properties. These materials have potential applications in electrochemistry, catalysis, hydrogen storage, adsorption of large organic molecules, and chiral chromatography. This approach combines knowledge in plant science, chemical manipulation and understanding of physical properties at a molecular level and enables the synthesis of sophisticated carbon-based mesoporous materials with tuneable surface and bulk properties.

Figures S1-S2 (supporting information) show porous distribution data obtained by BJH-method for the compounds under study. Figure S3 shows results of thermograviometric analysis of starbons.

![Figure 1s. Texture properties of starbons: A) Nitrogen adsorption and desorption isotherm. B) BJH pore size distribution of starbons in mesoporous region. Lines draw to same scale but offset for clarity.](image-url)
Figure S2. Characterisation of pore distribution in micropore region as studied by MP method for starbons prepared at 450°C, 600°C and 700°C. A- dV/dD pore volume, B- cumulative pore volume.

Figure S3. Results of thermogravimetric analysis of starbons: A and B – behaviour of original expanded starch and acid doped expanded starch. C and D- behaviour of carbonaceous materials.
Figure S4. $^{13}$C MAS NMR spectra showing the formation of Starbons from expanded starch at different temperatures.