

## Horse Chestnut Starch: A Noble Inedible Feedstock Source for Producing Thermoplastic Starch (TPS)

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**Abstract :** Starch isolated from non-edible *A. hippocastanum* seeds was characterized and used for preparing starch-based materials. The apparent amylose content of the isolated starch was 33.1%. The size of starch granules ranged from 0.7 to 35µm, and correlated with the shape of granules (spherical, oval and irregular). The chain length distribution profile of amylopectin showed two peaks, at polymerization degree (DP) of 12 and 41-43. Around 53% of branch unit chains had DP in the range of 11-20. *A. hippocastanum* starch displayed a typical C-type pattern and the maximum decomposition temperature was 317°C. Thermoplastic starch (TPS) prepared from *A. hippocastanum* with glycerol and processed by melt blending exhibited adequate mechanical and thermal properties. In contrast, plasticized TPS with glycerol:malic acid (1:1) showed lower thermal stability and a pasty and sticky behavior, indicating that malic acid accelerates degradation of starch during processing.

**Keywords :** *Aesculus hippocastanum* L., amylopectin structure, thermoplastic starch, non-edible source

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