1117-05-313 **Shoichi Tsuchiya*** (s.tsuchiya@isc.senshu-u.ac.jp), 2-1-1 Higashimita, Tama-ku, Kawasaki-shi, Kanagawa 214-8580, Japan. *Maximal homeomorphically irreducible trees in P_6-free graphs.*

A tree with no vertices of degree two of a graph is called a *homeomorphically irreducible tree* (*HIST*) of the graph. In particular, if a HIT is a spanning tree, then it is called a *homeomorphically irreducible spanning tree* (*HIST*). If a graph G has no induced path of order i, then G is called a P_i-free graph. In 2013, it was proved that every connected P_4-free graph with order at least 6 and minimum degree at least 3 has a HIST. Later, it was proved that every connected P_5-free graph with order at least 8 and minimum degree at least 3 has a HIST. Thus one may consider that, for any integer $i \geq 4$, there exist positive integers n and m such that every connected P_i-free graph of order at least n with minimum degree at least m has a HIST. However, recently we found that there exists an infinite family of connected P_6-free graph without HIST even if we assume large order and minimum degree. In this talk, we show a theorem which guarantees a large HIT in a connected P_6-free graph, i.e., there exists a positive integer n_0 such that every connected P_6-free graph of order $n \geq n_0$ with minimum degree at least m has a HIT T of order at least $\frac{m}{m+1}n - 1$. (Received January 17, 2016)