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# 落叶松人工林树干形状模型和可变参数

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## Stem profile model and variable-exponent of *Larix gmelinii* plantation.

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**摘要** 对以往树木干形的一系列可变参数削度方程进行比较，根据模型拟合统计量（残差平方和及相关指数），选出其中对落叶松干形拟合效果较好（残差平方和较小、相关指数较高）的模型，并根据模型中可变参数的意义提出了5种描述干形的指数.结果表明：Lee等提出的削度方程的拟合效果较好，可以用来描述落叶松人工林的树干形状；5种描述干形的指数分别为根部梢头削度率、影响点、圆柱体和抛物线体范围值、最小可变参数、最小可变参数所在的相对高度，这些指数可以作为比较干形的方法和工具.较大密度（870株·$hm^{-2}$）和较小密度林分（275株·$hm^{-2}$）的林木干形质量都较差，只有适中密度林分（487株·$hm^{-2}$）的落叶松干形质量较好.

**关键词：** 落叶松人工林 削度方程 可变参数 密度 干形

Abstract： A series of previous taper equations with variable parameters were compared in this study. The model with better fitting results (smaller residual sum of squares and higher correlation index) for *Larix gmelinii* taper was selected in terms of model fitting statistics (residual sum of squares and correlation index), and five indices for describing the taper were proposed, according to the meanings of variable parameters in the model. Among the taper equations compared, the equation provided by Lee *et al*. had better fitting effect, and could be used to describe the tapers of *L. gmelinii* plantation. The five indices including taper rate of root, influence point, ranges of parabolic and paraconic, minimum of variable parameters, and relative height at minimum of variable parameters could be taken as the methods and tools for comparing the tapers. Only moderate stand density (487 plant·$hm^{-2}$) provided good quality of larch stem form, compared to both high (870 plant·$hm^{-2}$) and low (275 plant·$hm^{-2}$) stand density providing poor quality.

Key words： *Larix gmelinii* plantation taper function variable-exponent density stem form



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