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IERI Procedia 5 (2013) 10 – 13

Procedia IERI

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2013 International Conference on Agricultural and Natural Resources Engineering

Wild Energy Plant Resources, Conservation and Sustainable Use of Sanqingshan in Eastern China

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Abstract

Accompany with the energy crisis and pollution, came the energy plant, the biomass energy relying mainly on energy plant should be developed. Energy plants are vital strategic resource to secure the state energy supply and to respond possible energy crisis at present and in the future. Sanqingshan has a wide variety of the wild energy plant resources, having an estimate of more than 100 species. This paper studies on the species diversity status, protection and sustainable use of the wild energy plant resources in Sanqingshan. Some energy plants are characterized by fast growth, high yield, high oil content, good burning quality, and potential exploitable worth, including Lauraceae, Magnoliaceae, Theaceae, Sapindaceae, *Prunus* of Rosaceae and *Carya* of Juglandaceae and *Jatropha curcas, Sloanea hemsleyana*, *Sloanea sinensis*, and so on. Besides to biodiesel, the development of energy plants can bring various resources such as wood, fragrance materials, fruits, medicine materials and rubber, for seeds are the main oil containers in these plants, in the same time. Some suggestions on the sustainable use and development of energy industry in the region were put forward.

Key words: Energy plant, Wild Resources, Environmental conservation, Sustainable use, Sanqingshan

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doi:10.1016/j.ieri.2013.11.063

1. Introduction

Accompany with the energy crisis and pollution, came the energy plant, the biomass energy relying mainly on energy plant should be developed. Energy plants are vital strategic resource to secure the state energy supply and to respond possible energy crisis at present and in the future (Ragauskas *et al*, 2006; Wen, 2007). Development biomass energy and selection energy plant to alternative fossil fuels is an important way to ease the energy crisis and reduce greenhouse gas emissions. Energy Plant with its rich resources, renewable, zero emissions of carbon dioxide and other advantages will become an important alternative energy sources (Liu *et al*, 2010; Wan and Fang, 2008; Ramos *et al*, 2009).

Sanqingshan is located on east north of Jiangxi province, Eastern China, it has a wide variety of wild energy plants, many of them has not been used, Therefore, the development and utilization of wild energy plant resources is of great potential. By developing and utilizing the wild energy plant resources, we can form some advantages as new industries, in order to avoid loss of wild energy plant resources when use plant resources, protection should be taken, and the protection is a long-term use for wild energy plants.

2. Species diversity status of wild energy plant resources in Sanqingshan

Sanqingshan has diverse biodiversity, based on the investigation mentioned (Peng *et al*, 2008), there are 2373 species higher plants(including culture species)from 984 genera belonging to 253 families, Among them, there are 368 species of Bryophyta from 165 genera belonging to 65 families, 179 species of Pteridophyta from 71 genera belonging to 34 families, 24 species of Gymnopermae from 22 genera belonging to 6 families, and 1802 species of Angiospermae from 726 genera belonging to 148 families.

Energy plants are plant resources of edible oil, industrial oil and paint raw materials, and there are about 100 species of energy plants, account for an estimated 5% of wild plant resources in Sanqingshan region.

In this area, the *Camellia oleifera*, *C. japonica* and *C. chekiang-oleosa* of Camelliaceae are rich and have high oil content, and can be used for human consumption. Tea seed oil of *C. sinensis* can be used as lubricants of precision machinery and lubricants. *Lindera megaphylla* of Lauraceae is evergreen tree, common in evergreen broadleaved forest and brush land, and its kernel of seed is non-drying oil, which is used for soap raw material, and its seed oil can be also used for soap raw material. *Litsea cubab* is common, born in hillsides, hillsides, shrub, woodland or on-street and other places, and its seed oil is used for industrial oil. *Mallotus apelta* of Euphorbiaceae is a shrub or small tree, common, born in shrubs or the sides of villages and its seed oil is used for soap and so on. *Celtis sinensis* of Ulmaceae is decduous tree, born on forest edge, village, street, and its wood is light and hard that can be made of made of furniture. Its seed oils can be used for lubricating oil. *Ailanthus altissima* of Simaroubaceae is deciduous tree, common in the region and born in hillside, limes of villages, and seeds can be extracted to oil. Moreover, energy plants have *Pinus massniana* of Pinaceae, *Cunninghamia lanceolata* of Taxodiaceae, *Taxus wallichiana* var. *mairei* of Taxaceae, *Cinnamomum camphora*, *C.micranthum, C. porrectum, C. sudauenium, Lindera aggregata, Lindera communis, Lindera glauca, Litsea cubeba, L. rotundifolia* var. *oblongifolia, Machilus grijsii, Machilus velutina, Machilus thunbergii, Phoede sheareri* of Lauraceae, *Capsella bursapastoris*, *Cardamine hirsuta* and *Lepidium virgnicum* of Cruciferae, *Celosia argentea* of Amarantaceae, *Idesia polycarpa* and *Xylosma congesta* of Flacourtiaceae, *Camellia breuistyla*, *C. cuspidate* and *Ternstroemia gymnanthera* of Camelliaceae, *Firmiana simplex* of Sterculiaceae, *Urena lobata* of Malvaceae, *Glochidion puberum*, *Mallotus lianus*, *Sapium discolor*, *Sapium japonicum* and *Sapium sebiferum* of Euphoriaceae, *Lauroceasus phaeosticta* of Rosaceae, *Aeschynomne indica*, *Daldergia*, *Millettia* and *Sophora flauescen* of Papilionaceae. *Lithocarpus glaber* of Fagaceae, *Broussonetia papyrifera* and *Ficus pumila* of Moraceae, *Boehmeria niuea* of Urticaceae, *Paliurus ramosissimus* of Rhammaceae, *Melia azedarach* of Meliaceae, *Euscaphia japonica* of Staphyleaceae,