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Subtropics

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**Agrobiodiversity and its Importance in Homegardens
of Hill Tribes in Xishuangbanna, SW China**

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Summary

Homegardens are one of the oldest agricultural systems and are commonly considered as sustainable production systems (KUMAR & NAIR, 2004; SOEMARWOTO & CONWAY, 1992; TORQUEBLAU, 1992). They are characterized of harbouring high agrobiodiversity which is important for better resilience and functioning of agro-ecosystems (DAS & DAS, 2005; EYZAGUIRRE & LINARES, 2004; KEHLENBECK & MAASS, 2005). Homegardens have received scientific attention around the world. According to our knowledge though, information regarding homegardens in Xishuangbanna, SW China, is lacking. The objectives of this study are the description of diversity and management of homegardens in Xishuangbanna. The contribution to rural people's livelihood with regard to subsistence production and cash income through homegarden products were also assessed. Useful plants in homegardens of Lahu, Akha and mountain Han ethnic groups in Naban River Watershed National Nature Reserve (NRWNNR) have been studied and compared with Dai ethnic group. Altogether, 29 homegardens have been inventoried. Data was collected through on-farm observation and measurement of species frequency and abundance, botanical sampling and ethnobotanical and semi-structured interviews with villagers. Shannon-, Margalef- and Simpson-Index were calculated and compared between villages. The influence of homegarden size, altitude and per capita income on plant diversity was tested using Spearman's Rho correlation coefficient. Cluster analysis was performed to classify different homegarden types using Ward's method with the Euclidean distance as a measure of similarity. To compare villages with regard to species composition of homegardens, ANOSIM (Analysis of similarities) test was performed. Nonmetric Multidimensional Scaling (NMS) was applied to visualize similarity of homegarden samples based on ranked distances.

In sampled homegardens a total of 298 species of useful plants from 82 families were recorded. Dominant families are *Asteraceae* (11.7%, 34 spp.), *Fabaceae* (6.6%, 19 spp.), *Solanaceae* (5.2%, 15 spp.), *Amaranthaceae* and *Cucurbitaceae* (3.8%, 11 spp.). Most of the species found in the homegardens are herbs (69.4%) followed by trees (16.2%) and shrubs (9.8%), lianas (2%), culms (1.4%) and epiphytes (1.3%). Regarding total number of recorded plants, medicinal uses constitute the highest percentage (44.9%) followed by food plants (39.6%), ornamental uses (7.7%), domestic animal fodder (4.8%) and 'others' (2.9%), including uses for timber. Some of the species have multi-purpose uses (20.1%). Looking at cultivated and transplanted species and excluding self-grown plants, food plants make up the highest share (55.6%) and second are medicinal plants (29.9%) which shows that a high

proportion of self-grown species have a potential medicinal use. *Acorus calamus*, *Paris polyphylla* and *Solanum erianthum* have been identified as important medicinal plants and basic food plants were *Colocasia esculenta*, *Capsicum annuum* and *Solanum melongena*. Correlation analysis revealed that homegarden size is strongly correlated with species richness ($r=0,818$) whereas there has been no significant correlation between plant diversity and altitude as well as per capita income. The vast majority of surveyed households did not apply pesticides and chemical fertilizer in their garden. Mostly, homegarden products were used for self-consumption (100% of all surveyed households), followed by exchange of homegarden products with other households (17.2%) and market sale (10.3%). According to ANOSIM analysis there are significant differences in species composition between the villages. Also results of cluster analysis and NMS illustrate that homegardens tend to group to samples from the same village.

Homegardens in the study area show high plant diversity and are important to satisfy household's subsistence needs especially with regard to food production and primary healthcare. Most products are employed for self-consumption whereas market sale of homegarden products only plays a very limited role. Results of analysis indicate that there are significant differences between homegardens belonging to different villages and ethnicities.