

Antimalarial plants used by indigenous people of the Upper Rio Negro in Amazonas, Brazil

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This is the first intercultural report of antimalarial plants in this region. The aim of this study was to document the medicinal plants used against malaria by indigenous people and to review the literature on antimalarial activity and traditional use of the cited species. Participant observation, semi-structured interviews, and ethnobotanical walks were conducted with 89 informants in five indigenous communities between 2010 and 2013 to obtain information on the use of medicinal plants against malaria. We reviewed academic databases for papers published in scientific journals up to January 2014 in order to find works on ethnopharmacology, ethnobotany, and antimalarial activity of the species cited. Forty-six plant species belonging to 24 families are mentioned. Seven plant species showed a relatively high consensus. Among the plant parts, barks (34.0%) and roots (28.0%) were the most widely used. Of the 46 species cited, 18 (39.1%) have already been studied for their antimalarial properties according to the literature, and 26 species (56.5%) have no laboratory essays on antimalarial activity. Local traditional knowledge of the use of antimalarials is still widespread in indigenous communities of the Upper Rio Negro, where 46 plants species used against malaria were recorded. Our studies highlight promising new plants for future studies: *Glycidendron amazonicum*, *Heteropsis tenuispadix*, *Monopteryx uauacu*, *Phenakospermum guianensis*, *Pouteria ucuqui*, *Sagotia brachysepala* and notably *Aspidosperma schultesii*, *Ampelozizyphus amazonicus*, *Euterpe catinga*, *E. precatorea*, *Physalis angulata*, *Cocos nucifera* and *Swartzia argentea* with high-use consensus. Experimental validation of these remedies may help in developing new drugs for malária.

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Genomic diversity of African population and pharmacogenetics in the safe and efficacious use of efavirenz in the treatment of HIV/AIDS

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There is limited data on the genomic diversity of African population and its implications for medicine. We therefore, explored the genomic diversity of African population and investigated the pharmacogenetics of efavirenz in the treatment of HIV/AIDS patients. 2000 DNA samples from individuals belonging to 10 major African ethnic groups, the Yoruba, Ibo and Hausa (Nigeria), the Kikuyu, Luo and Masaai from Kenya, the Shona, Ndebele and San (Zimbabwe), and the Venda (South Africa) were genotyped using the illumina 600K SNP microarray chip. The samples were also genotyped using traditional PCR methods for 20 SNPs in 6 pharmacogenes (NAT-2, FMO, CYP2B6, CYP2D6, CYP2C19, and GSTM). The data were analyzed using principal component analysis. The pharmacogenetics of efavirenz, were studied in 500 HIV/AIDS patients on anti-retroviral treatment. The role of CYP2B6 genetic variants as possible biomarkers for CNS has adverse effects associated with the use of efavirenz was explored. A pharmacogenetics guided dosing algorithm was derived using pharmacometric modeling. The population genotyping confirmed, with greater resolution that the genomic diversity of African population is more when compared to Caucasian and Asian populations. The results of the efavirenz pharmacogenetics study showed that the low activity of CYP2B6*6 variant is more prevalent in African populations, which correlated with more patients having high drug concentrations and higher incidences of CNS side effects. The pharmacogenetics guided dosing algorithm showed that patients homozygous for the CYP2B6*6 required 200 mg/day of efavirenz compared to the standard dose of 600 mg/day. More than 20% of patients in Africa would require such dose reduction.

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