**Letter No. 2240-MRP/15-16/KLCA019/UGC-SWRO Date: 31-03-2016**

**Title: Assessment of constituents of essential oil in intraspecific variants of *Centellaasiatica*- a medicinally and cosmeceuitically valuable plant**

**Executive Summary**

*Centellaasiatica* (L.) Urb. (Apiaceae), commonly known as ‘Indian Pennywort’ is a perennial herb with creeping stem. The plant is used in India, in traditional systems of medicine and folk medicine to cure various human ailments. The plant shows a wide range of morphological and chemical variation. It is commonly known as mandukparni or Indian pennywort, it has been used as a medicine in the Ayurvedic tradition of India for thousands of years and listed in the historic ‘Sushruta Samhita’, an ancient Indian medical text. This species is pantropical in distribution and occurs throughout India from plains to hill ranges up to 2000m. In India, it is used in traditional systems of medicine such as Ayurveda, Sidha, Unani, etc. and folk medicine to cure various ailments such as mental retardation, ulcer, tumour, filariasis, leprosy, dysentery, cholera and diarrhoea. The plant is cooling, alterative, soporific, cardio tonic, nervine tonic, sedative to nerves, stomachic, carminative, improves appetite, antileprotic, antiseptic, diuretic, exhilarant, demulcent, tonic to vital organs, tonic to memory and febrifuge. It is also used in cosmetic industry.In Ayurveda, it is one of the main herbs for revitalizing the nerves and brain cells.

Due to the over exploitation of the plant from the wild leads to gene erosion. So conserving the entire gene pool is essential. The findings obtained from this study will help to select better genotypes for conservation and sustainable utilization through cultivation. The selected plant can also be used for hybridization to obtain high yielding progenies according to the quality of essential oil.

This study assesses the variability in essential oil constituents of 14 samples of *Centellaasiatica* collected from the 14 districts of the Kerala State. Essential oil was extracted from the whole plant by hydrodistillation using Clevenger apparatus. Oil yield ranges from 0.21 to 0.62 ml per kg of fresh plant materials. The oil was diluted with diethyl ether and analysed using Agilent 7890A and 5975C GC System equipped with DB-5 MS coupled with MSD ion trap mass detector. The constituents were identified by, MS library search and comparison of mass spectrum reported in literature. Major compounds in the essential oil of *C. asiatica* are sesquiterpenoids. The sesquiterpenes present in the samples are E- caryophyllene, Caryophyllene oxide, Caryophyllene, 6,9-guaiadiene, cis-muurola-3,5-diene, dauca-5,8-diene, Amorpha-4,7-(11)-diene, aristolochene, γ-Cadinene, Germacrene-B, globulol, muurola- 4,10(14)-dien-1-b-ol, Copaene and 7-epi--α-Eudesmol. There monoterpenes present in the samples are δ-Terpineol, Meta-cymen-8-ol, Sabinene, α-Pinene, β-Pinene, Camphene, β-Myrcene, α-Phellandrene, α-Terpinene, γ-Terpinene, o-Cymene, Bornyl acetate and trans-carveol. Percent content of these components is significantly varying among the samples collected from various locations of Kerala. Some compounds showed complete absence in some samples which are present in other samples. This study reveled intraspecific variability in *Centellaasiatica* with respect to the yield and quantity of various constituents of essential oil.

Major findings are below:

* The species shows significant variation in various morphological characters
* From the essential oil 31 major volatile compounds were identified
* Sesquiterpenoids are the major class of compounds (65%)
* Essential oil yield and percentage content of the constituents varied considerably among the samples of the species *C. asiatica*
* Observed some positive correlation between the constituents of essential oil and morphological traits