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Drying Period had a Significant Effect on the Yield of *E. elatior* Essential Oil Production

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Worldwide the herbal medicines alone or in combination with other medicines are used to treat the diseases. Their preparation is a difficult process which can leads to the variation in quality and quantity of final product and one such product is the essential oils of plants. The major contributors that may bring variation in final product are plant breed/genetics, its physiology, chemical and microbial contaminations, heavy metal contents and the organs used for compounds extraction (Tanko *et al*., 2005). Moreover, a high-quality medicinal product can be obtained only form a good medicinal plant. *Etlingera elatior* is an herbaceous medicinal plant which is also known as "torch ginger" and it belongs to family Zingiberaceae. Its leaves in mixture with other aromatic herbs are used by post-partum women for bathing (Chan *et al*., 2009). Whereas, its fruits have antihypertensive antimicrobial, antioxidant and antitumor activities; its oil also possesses many significant biological activities (Mohamad *et al*., 2005). The leaves of *E. elatior* showed most outstanding antioxidant properties among five *Etlingera* species investigated. Thus this plant has a significant medicinal importance and can be used to treat health problems. In another study conducted on 26 ginger species *E. elatior* showed the highest phenolic contents and antioxidant property (Chan *et al*., 2008). And recently, it has been observed that drying technique has significant impact on phenolic content and antioxidant property of *E. elatior* leaves (Chan *et al*., 2009). It can increase the essential oils extraction, if plant is harvested at accurate time and dried at favorable temperature (Carvalho Filho *et al*., 2006). Hence, drying being the most common is an elementary method for post-harvest preservation of plants because it provides quick conservation of the medicinal qualities with uncomplicated manner (Muller and Heindl, 2006). It can increase the concentration of certain compounds in oils, may be due to the chemical reactions-mediated transformations (Faridah *et al*., 2010). But drying for long period of time can decrease oils concentration, which may be due to the release of volatile compounds (Combrinck *et al*., 2006).

Abdelmageed *et al*. (2011) conducted a research with an aim to study the effect of post-harvest drying period on essential oil yield and composition of some parts of *E. elatior*. Its parts were dried for 6, 24, 48 and 72 h and their essential oil composition was analyzed with the help of gas chromatography-mass spectrometry. It was observed that all the plant parts used have different oil composition as leaves: 35, pseudostems: 18, rhizomes: 28 and inflorescence have 18 chemical compounds. These plant parts show maximum oil production at different drying time intervals. As leaves give maximum oil production after 48 h drying, while pseudostems and rhizomes give maximum yield after 26 and 6 h, respectively. On the other hand, inflorescence shows maximum yield at two time intervals viz. 24 and 72 h. Since, it must be clear that plant organs have different drying time needs to give maximum oil extracts. Moreover, these oils have 45 new compounds which were not reported previously, while some previously reported compounds of *E. elatior* were absent in these extracts. Thus the essential oil composition can vary within the species and its parts, which can be categorized according to the presence of abundant chemical. As "the most prominent compounds identified with the highest percentages were 2-cyclohexen-1-one (93.42%) from leaves dried for 6 h, 2-tridecanone (51.55%) from pseudostems dried for 24 h, 1-dodecanol from rhizomes (63.64%) dried for 48 h and from inflorescences (54.48%) dried for 24 h". The drying time also cause changes in the physical characters like smell and color of these oils. For example leaf extracts obtained from 6 hour drying have strong smell and no color while that obtained from 72 h drying have yellow color and moderate smell. Likewise oils form other plants parts also shows the varying physical properties. Thus drying treatment affects both the physical as well chemical features of *E. elatior* oils and the selection of perfect drying time will favor the extraction of highly nutritive essential oils. Many previous researches depicted the importance of drying treatments, according to Asekun *et al*. (2007); the dried plant material of *Mentha longifolia* gave more essential oils than fresh leaves materials. On the other hand Carvalho Filho *et al*. (2006) reported drying can decrease the essential oil contents of *Ocimum basilicum*. Well this may be due to the different plant material used in these experiments as plants are different in their physiology, which is determine by their genetic makeup. Thus drying technique can alter the chemical composition of essential oils but it depends on the material used.

From the above mentioned research works it is evident that drying is a simple method which reserves the medicinal and nutritional values of plants. Some variations in the final medicinal products of plants are possible, which might be due to the fact that plants have different genetics which determine their metabolic products. Moreover, this divergence may be due to postharvest storage conditions or environment provided to plant. As Abdelmageed *et al*. (2011) in an

experiment conducted on *E. elatior* observed that drying period length can bring changes in oil composition extracted from some parts of same plant. They predict that the change in oils composition depends on the time of drying, leading to the release and transformations of its chemicals. So to get the maximum benefits from a plant extract or its essential oil, extraction procedure should be optimized for each plant species.

REFERENCES

Abdelmageed, A.H.A., Q.Z. Faridah, A. Nur Amalina and M. Yaacob, 2011. The influence of organ and post-harvest drying period on yield and chemical composition of the essential oils of *Etlingera elatior* (Zingiberaceae). J. Med. Plants Res., 5: 3432-3439.

Asekun, O.T., D.S. Grierson and A.J. Afolayan, 2007. Effects of drying methods on the quality and quantity of the essential oil of *Mentha longifolia* L. subsp. Capensis. Food Chem., 107: 995-998.

Carvalho Filho, J.L.S., A.F. Blank, P.B. Alves, P.A.D. Ehlert and A.S. Melo *et al*., 2006. Influence of the harvesting time, temperature and drying period on basil (*Ocimum basilicum* L.) essential oil. Braz. J. Pharmacogn., 16: 24-30.

Chan, E.W.C., Y.Y. Lim, L.F. Wong, F.S. Lianto and S.K. Wong *et al*., 2008. Antioxidant and tyrosinase inhibition properties of leaves and rhizomes of ginger species. Food Chem., 109: 477-483.

Chan, E.W.C., Y.Y. Lim, S.K. Wong, K.K. Lim, S.P. Tan, F.S. Lianto and M.Y. Yong, 2009. Effects of different drying methods on the antioxidant properties of leaves and tea of ginger species. Food Chem., 113: 166-172.

Combrinck, S., A.A. Bosman, B.M. Botha, W. Du Plooy, R.I. Mccrindle and E. Relief, 2006. Effects of post-harvest drying on the essential oil and glandular trichomes of *Lippia scaberrima* sond. J. Essent. Oil Res., 18: 80-85.

Faridah, Q.Z., A.H.A. Abdelmageed, A.N. Nor Hazirah and M. Yaacob, 2010. Comparative study of essential oil composition of leaves and rhizomes of *Alpinia conchigera* Griff. at different post-harvest drying periods. J. Med. Plants Res., 4: 2700-2705.

Mohamad, H., N.H. Lajis, F. Abas, A.M. Ali, M.A. Sukari, H. Kikuzaki and N. Nakatani, 2005. Antioxidative constituents of *Etlingera elatior*. J. Nat. Prod., 68: 285-288.

Muller, J. and A. Heindl, 2006. Drying of Medicinal Plants. In: Medicinal and Aromatic Plants, Bogers, R.J., L.E. Cracker and D. Lange (Eds.). Springer, Netherland, pp: 237-252.

Tanko, H., D.J. Carrier, L. Duan and E. Clause, 2005. Pre- and post-harvest processing of medicinal plants. Plant Genet. Resour.: Charact. Utilization, 3: 304-313.