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PE-19　Aboveground respiratory behavior of two mangrove species in Manko Wetland, Okinawa Island

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Plant respiration plays a vital role in global carbon balance. Aboveground nighttime respiration was measured for 56 sample plants of *Kandelia obovata* Sheue, Liu & Yong and 54 sample plants of *Bruguiera gymnorrhiza* (L.) Lamk. to investigate the size-dependence of the respiratory behavior of these mangrove plants in the field conditions. At the same time, censuses were carried out in the two different monospecific plots to investigate the frequency distribution of tree size $D_{0.1H}^2H$ (*H*, tree height; $D_{0.1H}$, stem diameter at 10% of *H*) and finally to calculate stand respiration. To measure the respiration of individual plants, the enclosed standing-tree method was adopted with a CO_2 probe (Vaisala GMP343, Finland). For both the species, the dependence of the respiration on the tree size was successfully represented by a power function of $D_{0.1H}^2H$. In case of *K. obovata*, the exponent was close to 3/4. This exponent value is supported by Enquist-group's theoretical model. On the other hand, in case of *B. gymnorrhiza* the exponent was close to 2/3. This result is supported by Ninomiya-Hozumi's findings, in which the respiration per tree is proportional to its surface area. Specifc respiration rate (with respect to $D_{0.1H}^2H$) was almost constant ($t = 0.421$, $p = 0.676$) under different light conditions for *K. obovata*, whereas it significantly increased with decreasing light intensity in *B. gymnorrhiza* ($t = 3.59$, $p = 7.29 \times 10^{-4}$). Stand biomass of *K. obovata* was 113.4 Mg ha^{-1} and the stand respiration was accounted as 1.03 Mmol CO_2 ha^{-1} yr^{-1} (27.7 Mg d.m. ha^{-1} yr^{-1}). Stand respiration of *B. gymnorrhiza* was 1.67 Mmol CO_2 ha^{-1} yr^{-1} (45.1 Mg d.m. ha^{-1} yr^{-1}).