**Potential application of Vis-NIR Hyperspectral Imaging for online sorting of defective Goji Berry (*Lycium barbarum* L.)**

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**Keywords.** Water use, sorting, PLSDA, spectroscopy, fruit quality, damage

**Abstract.** Goji berries are widely recognized for their outstanding health benefit and antioxidant properties. The fruit is very susceptible to mechanical damage and physiological disorders leading to quality depreciation and rapid loss of marketability. Therefore sorting high quality goji berries is very critical also for the small dimensions of the fruit which make the manual selection on conveyor belt impracticable. Hyperspectral imaging (HI) was used for the detection of main common defects. A panel of expert divided the fruit in 4 classes, sound, mild damages (i.e. visual damage, softening, bruise), moderate damages (i.e. pitting, initial mold), and severe damages (i.e. severe mold). Partial Least Square Discriminant Analysis (PLSDA) with repeated double cross validation was used with the aim of discriminating 2 classes (sound and defective) and for 4 classes (sound plus 3 defective classes) of fruit. The model with 2 classes gave excellent result (sensitivity and specificity higher than 96%), were the model with 4 classes gave higher error, particularly for the intermediate classes (sensitivity around 70% and specificity higher than 86%), while sound and severely damaged fruit were discriminated with higher accuracy. Considering that the main objective of sorting is to discard defective fruit, results of this study are very promising for developing non-invasive and reliable methods for early detection of common disorders in goji berry fruits and generally in small berries.