VEGETABLES

NPARR, 7(2), 2016-193 Micromorphology and anatomy of fruits and seeds of bitter melon (Momordica charantia L., Cucurbitaceae)

The aim of this paper is investigating the micromorphological properties of fruits and seeds in the food and medicinal plant Momordica charantia L. (Cucurbitaceae). A detailed anatomical description on cross-sections of immature fruits and seeds is reported for the first time. The fruit is characterized by a thin epicarp, a multi-layered mesocarp and by an inconspicuous endocarp. The seed-coat displays a pattern of organization in five tissues. These endomorphic features were compared and discussed with the results of previous investigations on other representatives of the genus Momordica. Since the structure of seed-coat is considered diacritical in the taxonomy of the genus, this report may offer a set of additional character useful for the characterization of the genus [C. Giuliani*, C. Tani, L. M. Bini (Univ Milan, Dept Pharmaceut Sci, Via Mangiagalli 25, I-20133 Milan, Italy), Acta Societatis Botanicorum Polonieae, 2016, 85(1), 3490].

NPARR, 7(2), 2016-194 The green peach aphid Myzus persicae perform better on pre-infested Chinese cabbage Brassica pekinensis by enhancing host plant nutritional quality

The green peach aphid, Myzus persicae Sulzer, is a notorious pest on vegetables, which often aggregates in high densities on crop leaves. In this study, we investigated whether M. persicae could suppress the resistance level of Chinese cabbage Brassica pekinensis. M. persicae performed better in terms of weight gain (similar to 33% increase) and population growth (similar to 110% increase) when feeding on previously infested (pre-infested) Chinese cabbage compared with those on non-infested plants. However, when given a choice, 64% of the aphids preferred to settle on non-infested leaves, while 29% of aphids chose pre-infested leaves that had a 2.9 times higher concentration of glucosinolates. Aphid feeding significantly enhanced the amino acid: sugar ratio of phloem sap and the absolute amino acid concentration in plant leaves. Aphid infestation significantly increased the expression levels of salicylic acid (SA) marker genes, while it had marginal effects on the expression of jasmonate marker genes. Exogenously applied SA or methyl jasmonate had no significant effects on M. persicae performance, although these chemicals increased glucosinolates concentration in plant leaves. M. persicae infestation increase amino acid: sugar ratio and activate plant defenses, but aphid performed better on pre-infested plants, suggesting that both nutrition and toxics should be considered in insect-plant interaction [He-He Cao, H. R. Liu, Z. F. Zhang, T. X. Lin* (State Key Lab Crop Stress Biol Arid Areas, Yangling 712100, Shaanxi, Peoples R China), Scientific Reports, 2016, 6, doi: 10.1038/srep21954].

NPARR, 7(2), 2016-195 Salinity thresholds and genotypic variability of cabbage (Brassica oleracea L.) grown under saline stress

Two botanical varieties of cabbage, namely Savoy (Brassica oleracea var. Sabauda L.) and White (Brassica oleracea var. Capitata L.) were used in order to understand the morphological, physiological and biochemical elements of functional salt stress response. Thirteen salt concentrations (range, 0 to 300 mmol L-1 NaCl) were considered in Experiment 1 and, of these 13, three (0, 100 and 200 mmol L-1 NaCl) were used in Experiment 2. Experiment 1 enabled the definition of two salinity thresholds (100 and 200 mmol L-1 NaCl), associated with morphological and physiological adaptations. In Experiment 2, moderate salinity (100 mmol L-1 NaCl) had lower effects on Savoy than in White cabbage yield (respectively, -16% and -62% from control). Concurrently, 100 mmol L-1 NaCl resulted in a significant
increase of antioxidant enzymes from control conditions, that was greater in Savoy (+289, +423 and +88%, respectively) as compared to White (+114, +356 and +28%, respectively) cabbage. Ion accumulation was found to be a key determinant in tissue osmotic adjustment (mainly in Savoy) whereas the contribution of organic osmolites was negligible.


NPARR, 7(2), 2016-196 Gastrokinetic activity of Amorphophallus paeoniifolius tuber in rats.

The tuber of Amorphophallus paeoniifolius (Family-Araceae), commonly called suran or jimikand, has medicinal and food value. It is used in ethnomedicinal practices for correction of gastrointestinal disturbances such as constipation and hemorrhoids. The present study evaluated the effect of A. paeoniifolius tuber on gastrointestinal motor functions.

The tuber was collected in December 2011, and its methanolic extract was standardized with the major phenolic compound, betulinic acid, by high-performance liquid chromatography. Rats were orally administered methanolic (APME) or aqueous (APAE) extract (250 and 500 mg/kg, each) of tuber for 7 days. Metoclopramide (MET) (3 mg/kg, orally) was used a reference prokinetic drug. The gastrointestinal parameters viz. number of feces, wet and dry weight and moisture content of feces, gastric emptying, and intestinal transit were evaluated. The isolated tissue preparations were used to check the effect of the extracts on fundus and intestinal contractility. The glucomannan and total phenolic and flavonoid contents were determined spectrophotometrically.

The pre-treatment of extracts significantly increased the number of feces, wet and dry weight of feces, moisture content, gastric emptying, and intestinal transit. Results were comparable to MET. Further, APME and APAE showed a contraction of fundus and ileum in isolated preparations. APME and APAE were also found to have fair amount of glucomannan, total phenolics, and flavonoids. The results indicate the gastrokinetic potential of the tuber extracts. This may be attributed to the presence of glucomannan and betulinic acid present in the extracts.

In conclusion, the tuber of A. paeoniifolius exhibits gastrokinetic activity and substantiates its traditional use in gastrointestinal motor disturbances [Y. N. Dey*, S. Mahor, D. Kumar, M. Wanjari, G. Sudesh; A. Jadhav (Department of Pharmacology, National Research Institute for Ayurveda-Siddha Human Resource Development, Gwalior, Madhya Pradesh, India), Journal of Intercultural Ethnopharmacology, 2016, 5(1), Pages 36-42].