



ISSN (E): 2277- 7695
 ISSN (P): 2349-8242
 NAAS Rating: 5.03
 TPI 2018; 7(3): 77-79
 © 2018 TPI
 www.thepharmajournal.com
 Received: 14-01-2018
 Accepted: 15-02-2018

Seema
 Department Food and Nutrition,
 Haryana Agricultural
 University, Hisar, Hayrana,
 India

Neelam Khetarpaul
 Department Food and Nutrition,
 Haryana Agricultural
 University, Hisar, Hayrana,
 India

Organoleptic evaluation and proximate composition of products from chickpea leaves and other leaves: Review

Seema and Neelam Khetarpaul

Abstract

Chickpea (*Cicer arietinum* L.) is an important pulse crop grown and consumed all over the world, especially in the Afro-Asian countries. It is a good source of carbohydrates and protein, and the protein quality is considered to be better than other pulses. Chickpea has significant amounts of all the essential amino acids. Natural oxidants have gained considerable interest in recent years for their role in preventing the auto oxidation of fats, oils and fat containing food products. In the present study, three plant foods viz, amla (*Emblicao officianalis*), drumstick leaves (*Moringa oleifera*) and raisins (*Vitis vinifera*) were used as sources of natural antioxidants. All the three extracts exhibited a high percentage of antioxidant activity which was evaluated using beta-carotene-lenoleic acid *in vitro* system, compared to synthetic antioxidants. It had been studied that the antinutrients contents of different products viz. soup, vegetable, *raita*, *parotha*, *pakora* and cutlet prepared by incorporating *chaulai*. The oxalic content of these products was 3.65, 5.13, 1.37, 1.46, 0.49, and 0.64 g / 100 g, respectively. The phytic acid content of soup was 199.0 mg/100 g, vegetable (169.07 mg / 100 g), *raita* (41.07 mg / 100 g), *parotha* (201.77 mg / 100 g), *pakora* (109.31 mg / 100 g) and cutlet (86.89 mg / 100 g) prepared by incorporating *chaulai*. The polyphenol content of these products were 18.92, 22.25, 3.13, 13.83, 15.75 and 15.04 mg tannic acid equivalent/g.

Keywords: Antioxidants, Oxalic content, Phytic acid, Antinutrients

Introduction

Organoleptic evaluation of chickpea leaves and other leaves products

Chickpea (*Cicerarietinum* L.) is an important pulse crop grown and consumed all over the world, especially in the Afro-Asian countries. It is a good source of carbohydrates and protein, and the protein quality is considered to be better than other pulses. Chickpea has significant amounts of all the essential amino acids.

Kaveri *et al.* (2004) ^[10] incorporated fresh (15.0 and 20.0%) and dehydrated (5.0 to 10.0%) *shepu* (*Peucedanum graveolens*) and *kilkeerae* (*Amaranthus tricolor*) in wheat based *papads*. The fired *papads* were subjected to sensory analysis by a panel of 100 members. *Papads* with 15.0-20.0 percent fresh greens and 5.0 percent dehydrated greens scored above 6 on a scale of 10 indicating acceptability of *papads* incorporated with greens. Natural oxidants have gained considerable interest in recent years for their role in preventing the auto oxidation of fats, oils and fat containing food products. In the present study, three plant foods viz, amla (*Emblicao officianalis*), drumstick leaves (*Moringa oleifera*) and raisins (*Vitis vinifera*) were used as sources of natural antioxidants. All the three extracts exhibited a high percentage of antioxidant activity which was evaluated using beta-carotene-lenoleic acid *in vitro* system, compared to synthetic antioxidants. Biscuits prepared by addition of natural extracts were subjected to sensory studies and chemical analysis. Biscuits treated with natural antioxidants, extracted from raisins (B4) and drumstick leaves (B5) received higher ($p \leq 0.05$) panel scores during storage period of 6 weeks, than control (B1), butylated hydroxyl anisole (BHA) (B2) and amla (B3) extract incorporated biscuits (Reddy *et al.*, 2005).^[14]

Kaur and Kochar (2005) ^[9] carried out a study on organoleptic evaluation of preparation using underexploited greens (greens of cauliflower; radish, turnip and carrot). To evaluate the products for sensory attributes Hopkin's seven point scale was used. The study revealed that the most acceptable level for *prantha* with radish and cauliflower greens was 30 percent whereas; in case of carrot and turnip greens it was 50 percent. The respective scores for overall acceptability ranged from 5.42 (cauliflower greens) to 6.02 (radish greens). *Bhujji* prepared by using cauliflower greens scored highest (6.08). *Poori* prepared by incorporating cauliflower and radish leaves at 40 percent was best acceptable with scores of 5.42 and 6.3 respectively.

Correspondence

Seema
 Department Food and Nutrition,
 Haryana Agricultural
 University, Hisar, Hayrana,
 India

Proximate composition of products from chickpea and other leaves:

Composition of *sag* prepared by blending different varieties of mustard leaves were analyzed by Kalra *et al.* (1990). They reported that moisture content ranged from 82.0 to 84.7 percent, protein 10.9 to 17.5 percent, fat 33.0 to 34.9 percent, crude fibre 9.4 to 12.5 percent and total ash 14.4 to 19.5 percent, respectively.

Kaveri *et al.* (2004) ^[10] incorporated fresh (15.0 and 20.0%) and dehydrated (5.0 to 10.0%) shepu (*Peucedanum graveolens*) and kilkeerae (*Amaranthus tricolor*) in wheat based *papads*. The fired *papads* were subjected to sensory analysis by a panel of 100 members. Fibre content of greens incorporated *papads* increased remarkably. The vitamin content of greens incorporated *papads* increased remarkably.

Yadav (1992) studied the antinutrients contents of different products viz. soup, vegetable, *raita*, *parotha*, *pakora* and cutlet prepared by incorporating *chaulai*. The oxalic content of these products was 3.65, 5.13, 1.37, 1.46, 0.49, and 0.64 g / 100 g, respectively. The phytic acid content of soup was 199.0 mg/100 g, vegetable (169.07 mg / 100 g), *raita* (41.07 mg / 100 g), *parotha* (201.77 mg / 100 g), *pakora* (109.31 mg / 100 g) and cutlet (86.89 mg / 100 g) prepared by incorporating *chaulai*. The polyphenol content of these products were 18.92, 22.25, 3.13, 13.83, 15.75 and 15.04 mg tannic acid equivalent/g.

Luthra and Sadana (1995) prepared '*sags*' individually and by combining green leafy vegetables like *bathua sag*, *bathua* + spinach *sag*, carrot leaves *sag*, redish leaves *sag*, redish + spinach *sag*. Cooked '*sag*' contained calcium, iron and phosphorus in range of 246 to 840, 22.0 to 76.4 and 82 to 118 mg per 100 g, respectively.

Kaveri *et al.* (2004) ^[10] incorporated fresh (15.0 and 20.0%) and dehydrated (5.0 to 10.0%) shepu (*Peucedanum graveolens*) and kilkeerae (*Amaranthus tricolor*) in wheat based *papads*. The fired *papads* were subjected to sensory analysis by a panel of 100 members. Mineral content of greens incorporated *papads* increased remarkably.

The acceptability of products with cauliflower leaves was carried out by Kowsalya and Mohandas (1999). ^[11] The study revealed that cauliflower leaves were used in the common south Indian preparations such as, *poriyal* and *kootu*. The drumstick leaves *poriyal* and *kootu* were used as standard for comparison. Identical scores were obtained for both standard and test *poriyal* with respect to appearance (4), color (4), and texture (3.8) on four point numerical rating scale. The higher total score was obtained for cauliflower leaf *poriyal* (19.8) with 90 percent of panel members opting it. Standard and test *kootu* was equally acceptable for appearance and colour (4) but the total score was highest for drumstick leaves *kootu* (19.6).

Lakshmi and Vimala (2000) dehydrated amaranth, curry leaves, *gogu* and mint leaves to prepare powders for incorporation in different products which were evaluated by panel of trained judges. The food products prepared using powders of amaranth (soup, *dhal* with greens and *pesarattu*), curry leaves (hot powder, *pakodi* and *pesarattu*), *gogu* (*dhal* with greens, *chutney* and mutton curry) and mint (vegetable *biryani*, *chutney* and bone soup) were rated as highly acceptable for all the sensory attributes and were scored from good (4) to excellent (5) on five point scale. However, soup with amaranth powder received slightly lower scores of 3.8 for overall acceptability, taste and flavour.

Dahiya (2004) ^[3] observed that *matthis* supplemented with

mothbean, spinach and fenugreek were 'moderately desirable' by the panel of ten judges for their colour, appearance, flavor, texture and taste when prepared fresh. Value added traditional products of Bangalore were acceptable with scores of 4.2 (*upma* and *dosa*) 4.1 (*majjigehuli*, *ambode* and *ladoo*) to 3.9 (*Bisebele bhath*) on five point scale in a study conducted at Bangalore (Anonymous, 2003). ^[2] Report from Hisar indicated that value added products (VAPs) with underutilized leafy vegetables, fruits and other vegetables were highly acceptable with scores of more than 7.0 on nine point hedonic scale (Anonymous, 2003).^[2]

The products, viz., bread, biscuit, noodles and macaroni prepared from the wheat fenugreek blends at 10, 15 and 20% levels, were found organoleptically acceptable (Hooda and Jood, 2004). The incorporation of fresh (15.0 and 20.0%) and dehydrated (5.0 to 10.0%) shepu (*Peucedanum graveolens*) and kilkeerae (*Amaranthus tricolor*) in wheat based *papads* resulted into the suitability of *papads* incorporated with green in terms of sensory and nutritional quality (Kaveri *et al.*, 2004).^[10]

In another study Shanthala and Prakash (2005) ^[15] explored the possibility of incorporating dried curry leaf powder (CLP) at 5 or 10% level of common dishes to increase the intake of greens as a source of micronutrients. Dried CLP was incorporated into *chapati* (unleavened Indian bread), seasoned potatoes and in cooked rice as a part of spice mixture and the acceptability was evaluated by 53 panel members. The addition of CLP affected the color and appearance of the products. At the lower level (5%) of incorporation, the texture, odour and taste of *chapati* were not affected. The spice mixture with CLP was highly accepted by the panel members.

Karva *et al.* (2010) ^[8] also reported the overall acceptability of *chapati* and *thalipattu* with rehydrated *rajagi* leaves was found extremely well (8). Verma and Jain (2012) ^[17] estimated fortifications of *mathri* with fresh and dehydrated vegetables and assessment of nutritional quality. Levels of incorporation of fresh greens (spinach, mint and carrot) in *mathri* were 8 percent, whereas, powder of the dry green vegetables (spinach, mint, carrot and lotus stem) was added in *mathri* at 7 percent. Results showed that the fresh vegetables *mathri* had the highest overall acceptability (7.8 ± 0.199) attributes and the score fell in the range of 'like very much'.

The dark green colour of spinach changes to olive green on thermal processing mainly due to conversion of chlorophyll into pheophytin and pyropheophytin. The process of chlorophyll degradation was found to be slow at lower temperatures (Ankita and Prasad, 2013).^[11]

Singh and Grover (2014) ^[16] reported that the overall acceptability of value added *Poori* with dehydrated chickpea leaves powder was found in the range of 6.42 to 8.44. The overall acceptability of value added *Chapati* with dehydrated leaves powder was found in between 8.4 at 7.5 percent level which was observed as very good.

References

1. Ankita, Prasad K. Studies on spinach powder as affected by dehydration temperature and process of blanching. Intl. J. Agri. and Food Sci. Technol. 2013; 4(4):309-316.
2. Anonymous. Gender perspective in farm and home management and utilization of underutilized foods towards household nutrition security, PSR-62, NATP. 2003.
3. Dahiya D. Development and nutritional evaluation of

- value added products from mothbean [*Vigna aconifotida* (Jacq.) Marecha¹]. M.Sc. Thesis, CCS HAU, Hisar, India.
4. Doymaz, I. Drying kinetics of white mulberry, J. of Food Engr. 2004; 61:341-346.
 5. Doymaz I. Air - drying characteristics of tomatoes. J. of Food Engr 2007; 78:1291-1297.
 6. Hooda S, Jood S. Nutritional evaluation of wheat-fenugreek blends for product making. Plant Foods Hum. Nutr. 2004; 59(4):149-154.
 7. Kalra CL, Beerh OP, Berry SK, Kulkarni SG, Kaur S, Sehgal RC *et al*, Evaluation of different varieties of mustard green (*Brassica* sp.) for canning of ready to serve 'Sag'. Indian Food Packer, 1990; 44(2):5-9.
 8. Karva S, Bharti P, Chinamnant B. Post-harvest processing of green leafy vegetables for iron security. Karnataka J. Agri. Sci. 2010; 23:306-310.
 9. Kaur TJ, Kochar GK. Organoleptic evaluation and retention of vitamin C in commonly consumed food preparations using underexploited greens. Indian. J. Nutr. Diet. 2005; 42:425-431.
 10. Kaveri GV, Gupta S, Lakshmi JA, Prakash J. Physiochemical characteristics and sensory attributes of wheat-based 'papads' incorporated with green leafy vegetables, J. of Food Qual., 2004; 27:259-270.
 11. Kowsalya S, Mohandas S. Acceptability nutrient profile of cauliflower leaves. Indian J. Nutr. Diet. 1999; 36(7): 332-338.
 12. Lakshmi B, Vimla V. Nutritive value of dehydrated green leafy powders. J Food. Sci. Technol. 2000; 37(5): 465-471.
 13. Luthra G, Sadana B. Nutritional evaluation of 'sags' prepared from bathua (*Chinopodium album*), carrot (*Daucus carota*) and redish (*Raphanus sativus*) leaves. Indian Food Packer. 1995; 55(1):33-38.
 14. Reddy V, Asna U, Kumar A. Evaluation of antioxidant activity of some plant extracts and their application in biscuits. Food Chem. 2005; 90(1, 2):317-327.
 15. Shanthala M, Prakash J. Acceptability of curry leaf (*Murraya keenigii*) incorporated products and attitude towards consumption. J. of Food Proc. & Preservn. 2005; 29:33-44.
 16. Singh A, Grover K. Post-harvest processing and standardization of value added cereal based traditional recipes for iron security. Asian J. Dairy & Food Res. 2014; 33(4):267-275.
 17. Verma S, Jain S. Fortification of *Mathri* with fresh and dehydrated vegetables and assessment of nutritional quality. Raj. J. Extn. Edu. 2012; 20:155-158.
 18. Yadav SK. Nutritional evaluation of some non-conventional green leafy vegetables. M.Sc. Thesis, CCS HAU, Hisar, India. 1992.