



## PHARMACOGNOSTICAL INVESTIGATION ON WHEAT GRASS.

**KUMAR SHANKUL<sup>1\*</sup>, SATISH V<sup>1</sup>, RAVI CHANDRA V D<sup>1</sup>, RAHUL S<sup>2</sup>,  
KAMBHOJA S<sup>3</sup> AND ASHUTOSH M<sup>4</sup>**

1. G.H.B. college of pharmacy, Aniyad, Gujarat.
2. Department of Pharmacy, KNIMT, Sultanpur, U.P.
3. Oxford College of Pharmacy, Bangalore.
4. A.N.D. College of Pharmacy, Babhanan, Gonda, U.P.

\*corresponding author

kumar.sankul@gmail.com

### ABSTRACT

Shoot of *Triticum aestivum* Linn. is also called as wheat grass, belonging to family: Gramineae. *Triticum* is a genus of annual and biennial grasses, yielding various types of wheat, native to southwest Asia and the Mediterranean region. *T. aestivum* Linn, common or Bread wheat, is widely cultivated almost all over the world. Generally, 15-20 species are recognized, of which about 8 have been reported to occur in India. It contains Polysaccharides-Glucans, Fatty oil (2%), Phospholipids (1%), Glycolipids (0.5%): particularly acyldigalactosyl glycerols, Steroids (0.3%): sterol esters, Proteins (20%), Lignin, Alkyl resorcinols (0.1 – 0.2%). The principal carotenoid pigment of wheat flour is  $\alpha$ -dihydroxycarotene. Small quantities of flavonoids are also present in wheat germ. Two derivative of apigenin, designated flavonoid A and flavonoid B have been identified. Pharmacologically wheat is used in the treatment of cancer and in acute diarrhoea. It is also used as antifungal and antioxidant.

In the present studies Pharmacognostical investigation were done on basis of transverse section, Powder analysis, and physicochemical parameter.

### KEY WORDS

*Triticum aestivum*, Flavonoids, Xylem, Phloem.

### INTRODUCTION

The Shoot of *Triticum aestivum* Linn. is also called as wheat grass, belonging to family Gramineae. *Triticum* is a genus of annual and biennial grasses, yielding various types of wheat, native to Southwest Asia and the Mediterranean region. *Triticum aestivum*, common or Bread wheat, is widely cultivated almost all over the world. Generally, 15-20 species are recognized, of which about 8 have been reported to occur in India.

The chemical constituents present in wheat are Minerals, Vitamins, Pigments, Enzymes, Proteins, carbohydrates<sup>1</sup>. Pharmacologically *Triticum aestivum* Linn. is used in the treatment of Cancer<sup>2</sup> and in acute diarrhoea<sup>3</sup>. It is also used as Antifungal<sup>4</sup> and Antioxidant<sup>5</sup>. In the present studies



## PHARMACOGNOSTICAL INVESTIGATION ON WHEAT GRASS.

Pharmacognostical investigation were done on basis of transverse section, Powder analysis, and Quantitative microscopy.

### MATERIALS AND METHODS

The Seeds of *Triticum aestivum* Linn were obtained from NSC Ltd, Hebbal and authenticated by CCRAS, Bangalore. The seeds were then sown in tray containing red soil with Horse manure, after 10-15 days fresh leaves were collected and used for further study.

T.S and Powder microscopy of the leaf were carried out and characters were observed.

Physicochemical parameters i.e. Loss on drying, Total ash, Acid insoluble ash, Water soluble extractive value, Alcohol soluble extractive value were carried out as per WHO Guidelines. The values are tabulated in table no.1

**Table 1.**  
*Physicochemical parameter of Wheat Grass*

Sample Identity	Moisture Content %	Total Ash %	Acid insoluble ash %	Water soluble ash %	Water soluble Extractive value%	Alcohol soluble Extractive value%
Leaves	4.05	7.5	2.3	4.0	2.5	3.75

### RESULTS

Transverse section of leaflet shows an Upper epidermis covered with cuticle. Only covering trichomes emerge from epidermal layer. Dumble shaped types of stomata are seen in the upper epidermis. Mesophyll is made up of uniform parenchyma cells, loosely arranged. Lower epidermis is very similar to upper epidermis. Midrib represents a flat ventral surface and convex dorsal surface. The epidermal layers are continuous over the midrib, collateral and conjoint vascular bundle is prominent occupying the central portion of the midrib. Vascular bundle is surrounded by sclerenchymatous tissues. Diagnostic characters seen in powder drug is Dumble shaped stomata along with the epidermal cells, lignified fragments of fibers, unicellular trichomes along with the epidermal cells and oval shaped Starch grains. Physicochemical parameter is tabulated in table no.1.

**PHARMACOGNOSTICAL INVESTIGATION ON WHEAT GRASS.**

*Powder Characteristics:*



a. Fragments of Fibres.



b. Unicellular Trichomes



c. Parenchyma cells.



d. Fibres.



e. Epidermal cells & Trichomes



f. Epidermal cells & stomata



g. Unicellular trichomes.10Xx40X



h. Epidermal cells.



i. Starchgrains.10xX40x



j. Parenchyma cells.10Xx40x

*Fig.2(a-j)*

**PHARMACOGNOSTICAL INVESTIGATION ON WHEAT GRASS.**

**I.S of Wheat Grass Leaves**

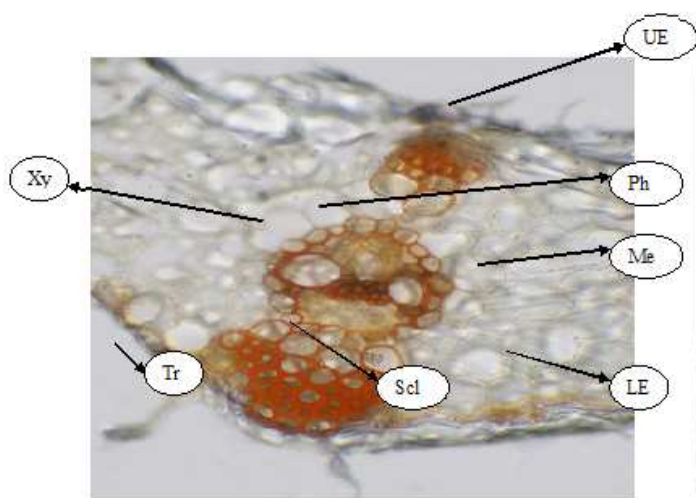


Fig.1a. T.S of the Leaf showing Vascular bundles (10x X 10x)  
 UE-upper epidermis, LE-lower epidermis, Ph-phloem, Xy- Xylem  
 Tr-trichome, Me-mesophyll cells, Scl-sclerenchyma.



Fig.1b. T.S of the Wheat Grass Leaf (Ground Plane) 10X

**DISCUSSIONS**

Macroscopic as well as microscopic studies of any plant drug are the primary steps to establish its botanical quality control before going to other studies. As per WHO guidelines, botanical standards are to be proposed as a protocol for the diagnosis of the herbal drug. *Triticum aestivum* Linn. is characterized by certain specific anatomical features of lamina, its powder characteristics and physicochemical characteristics. These microscopical and physicochemical parameters are proposed as protocol for the botanical standardization of *Triticum aestivum* Linn.

**ACKNOWLEDGEMENTS**

The authors are thankful to, The Chairman, Director, and Principal of GHB college of Pharmacy for providing facilities. The authors also thank

Dr.Gajendra Rao & Dr. TN Shantha, RRI, Bangalore for technical help.

**BIBLIOGRAPHY**

1. Mukherjee PK, Quality standard of herbal drugs, an approach to evaluation of botanicals, first edi. Business Horizons New Delhi: Pharmaceutical publisher 2002.
2. Rangari VD, Pharmacognosy and Phytochemistry I,first edi. Carrier publication 2001.
3. Quality standard of Indian medicinal plants, vol.3; Indian council of medical research New Delhi 2005.
4. The Ayurvedic pharmacopoeia of India part I, vol.3, first edition, published by the controller of publications civil lines Delhi.



## PHARMACOGNOSTICAL INVESTIGATION ON WHEAT GRASS.

5. Harbone JB, phytochemical methods, a guide to modern techniques of plant analysis, 3rd edi. springer (India) pvt. Ltd. 1998.
6. CSIR. The Wealth Of India, A Dictionary of Indian Raw Materials and Industrial Products Vol. X (sp-x). New Delhi: CSIR Publication;1976.
7. PDR, For Herbal Medicines, 3<sup>rd</sup> ed. Thomson PDR;2005.
8. D.Adinarayana and P. Ramachandraiah Chetty. Chemical investigation of some medicinal plants occurring in south India. Ind.j.chem.28: 453; 1985.
9. White LM, Sector GE. Chromatographic evidence for the occurrence of a fructosyl raffinose in wheat flour and wheat. Arch Biochem Biophys 1953; 44: 244-45.
10. Wasserman AR, Burris RH. Hemoprotein from wheat germ. Phytochemistry 1965; 4: 413-23.
11. Klepacka J, Fornal L. Ferulic acid and its position among the phenolic compounds of wheat. Crit Rev Food Sci Nutr 2006; 46(8): 639-47.
12. Day L, Bhandari DG, Greenwell P, Leonard SA, Schofield JD. Characterization of wheat puuroindoline proteins. FEBS J.2006; 273 (23): 5358-73.
13. Sue M, Ishihara A, Iwamura H. Occurrence and characterization of UDP- Glucose: hydroxamic acid glucotransferase isolated from wheat seedling. Z Naturforsch 2000; 55(9-10): 701-7.
14. Obel N, Porchia AC, Scheller HV. Dynamic change in cell wall polysaccharides during wheat seedling development. Phytochemistry 2002; 60 (6): 603-10.
15. Caruso C, Nobile M, Leonardi L, Bertini L, Buonocore V, Caporale C. Isolation and amino acid sequence of two new PR-4 proteins from wheat. J Protein Chem 2001; 20 (4): 327- 35.
16. Nagaoka H. Treatment of germinated wheat to increase levels of GABA and IP-6 catalyzed by endogenous enzymes. Biotechnol Prog 2005; 21(2): 405-10.
17. Julian EA, Jhonson G, Jhonson DK, Donnelly BJ. The glycoflavonoid pigments of wheat, *Triticum aestivum*, leaves. Phytochemistry 1971; 10 (12): 3185-93.
18. Malhotra BN, Rastogi Ram. Compendium of Indian Medicinal Plants Vol.3, reprint ed. Lucknow:CDRI; 2001.
19. Harborne JB, Broadley M, Frost S, Holm G. The flavonoids in leaves of diploid *Triticum* species. Plant systematics and evolution 2005; 154(2-3): 251-57.
20. Young MR, Neish AC. Properties of the ammonia- lyases deaminating phenylalanine and related compounds in *Triticum aestivum* and *Pteridium aquilinum*. Phytochemistry 1996; 5(6): 1121-32.
21. Hamilton-kemp TR, Andersen RA. Volatile compounds from *Triticum aestivum*. Phytochemistry 1984; 23(5): 1176-77.
22. Asenstorfer RE, Wang Y, Mares DJ. Chemical structure of flavonoid compounds in wheat (*Triticum aestivum* L.) flour that contribute to the yellow colour of Asian alkaline noodles. Journal of Cereal Science 2006; 44(1): 108-19.
23. Kluge Michale, Grambo HJ, Sicker Dieter. (2R)-2- $\beta$ -D-glucopyranosyloxy-4,7-dimethoxy-2H-1,4-benzoxazin-3(4H)-one from *Triticum aestivum* .Phytochemistry 1997;44(4): 639-41.