

ACKNOWLEDGMENT

Thanks to Allah, who gave me the chance for learning; gave me the support and love of all people. I would like to express my sincere gratitude to my supervisor **Dr. Samar Omar Abdullah Bin Rabah** Associate Prof. of Histology in Faculty of Science-King Abdulaziz University, for her constant help, encouragement, interest, guidance and many stimulating discussion during the course of my work.

I am profoundly grateful to **Dr. Siham Kamel Abunasef**, Associate professor of Histology, Faculty of Medicine, Anatomy department, King Abdulaziz University for her precise supervision all through the different steps of my work, patience in reading, correcting and criticizing this thesis. Her amiability and friendship will always be remembered.

I would also like to express my appreciation to all the staff members and my colleagues in the Department of Biology at the Faculty of Science, King Abdulaziz University for their kind assistance and encouragement. I also appreciate the role of library staff in Faculty of Medicine, King Abdulaziz University.

I would like also to thank all the staff of King Fahd Research center for helping me throughout my thesis.

I am very grateful to all the members of my family for their patience and support. Finally, words are insufficient and inadequate to express my indebtedness and appreciation to my husband and My children for their sacrifice, enthusiastic, invaluable assistance. Guidance of Allah and continuous encouragement of my husband were the main reasons to complete this work. Also, prayers of my mother. Supporting sisters in law were pushing me forward to do my best and without their continuous support and prayer I could not finish my thesis.

Tagreed ☺

Effect of *Moringa Oleifera* Lam on the Small Intestine of adult rats treated By Different doses of Voltaren

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ABSTRACT

Diclofenac Sodium (DS) is one of NSAIDS that was commonly used and may be used in high or toxic doses by mistake or postoperatively. *Moringa Oleifera* Lam (MO) were known for their multiple pharmacological effects including their anti-inflammatory effects. **Aim of the work:** The current study aimed at evaluating the possible protective role of MO on the experimentally induced microscopical changes of duodenal mucosa of adult rats following administration of different high doses of DS. **Materials and Methods:** Forty five rats were divided into the following groups (15 each): Group I was served as a control group, Group II was subgrouped to IIa, IIb and IIc, that were administered orally 50, 100 and 150 mg/kg/day of DS respectively for 2 days after fasting for 20 hours. Group III was subgrouped to IIIa, IIIb and IIIc. The rats were maintained on oral MO (500mg/kg) daily for 1 week, then they were administered the same doses as in the previous group. The animals were sacrificed 3 hours after the second dose and were dissected. Microscopic and morphometric studies were done on the excised duodenum. **Results:** A variety of histological changes was observed in group II . The changes were ranged from loss of the brush border to cellular lysis, destruction of villi, monocellular infiltrations and basal glandular ulcerations. The PAS stained sections showed focal negative expression of the brush border together. Although the goblet cells appeared significantly decreased in number, they had increased acidic mucin secretion. On the ultrastructure level, there were vacuolar cytoplasmic degeneration, disturbed microvilli arrangement with the underlying terminal web and defective junctional complex together with widening of the area of tight junctions. The mitochondrion was ranged from atrophy or ballooning and elongation. In group III that was treated by MO, the goblet cells were increased significantly in number and their secretion was mainly acidic mucin. By TEM, they showed different electron density of mucous granules. There was marked increase in the mononuclear cells of the lamina propria in both Group II and III compared to control group I. The previously mentioned changes were directly proportional to the dose of DS. The main difference in protected specimens was the stability of the membranes of the cells compared to those exposed to DS without intake of *Moringa*. **Conclusion:** The current study concluded that MO may have a partial protective effect on the duodenal mucosa in cases of high dose administration.

Key Words: *Moringa Oliefera* – NSAIDS- Duodenum-Electron microscopy-rat.

تأثير عشبة المورينجا على الامعاء الدقيقة فى الجرذان المعالجة بالفولتارين بجرعات مختلفة

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المستخلص العربى

إن عقار الديكلوفيناك صوديوم يعد من العقارات شائعة الاستخدام في أنحاء العالم وعند استخدامه عن طريق الخطأ او بجرعات عالية بعد العمليات الجراحية قد تودي الى أعراض تسمم. وقد عرفت شجرة المورينجا بأثارها الدوائية المتعددة بما في ذلك أثارها المضادة للالتهابات.

الهدف من العمل: تهدف الدراسة الحالية الى تقييم التأثيرات الوقائية المحتملة لأوراق المورينجا أوليفيرا على التغييرات المجهرية في الغشاء المخاطي للاثني عشر في الجرذان البالغة بعد تعرضها لجرعات مختلفة من ديكلوفيناك الصوديوم. المواد وطرق: وقد تم تقسيم الجرذان البالغة التي عددها 45 إلى المجموعات التالية: **المجموعة الاولى** وهى مجموعة ضابطة **والمجموعة الثانية** وقد قُسمت الى ثلاثة مجموعات تم اعطائها عن طريق الفم جرعات (50 و 100 و 150 ملغم/كغم) من ديكلوفيناك الصوديوم على التوالي لمدة يومين وذلك عقب منعها من الطعام لمدة عشرون ساعة ثم تركت لمدة ثلاث ساعات بعد أخذ الدواء **والمجموعة الثالثة** قسمت الى ثلاثة مجموعات وتم اعطاء الحيوانات جرعات من المورينجا (500 ملغم/كغم) عن طريق الفم يوميا لمدة اسبوع ثم تم اعطائها جرعات من الديكلوفيناك الصوديوم بنفس الجرعات السابق ذكرها مثل المجموعة السابقة، وتم ذبح الجرذان بعد ثلاث ساعات من أخذ الدواء للحصول على عينات الاثنى عشر ثم اجريت الدراسات للشكل الظاهرى ومجهرى على الاثنى عشر.

النتائج: أظهرت الدراسة مجموعة متنوعة من التغييرات الخلوية والنسيجية في المجموعة الثانية التي أعطيت الديكلوفيناك صوديوم ذلك بدون تناول المورينجا، وقد تراوحت التغييرات من فقدان الحافة الفرشية والتحلل الخلوي، وتدمير الخملات، وانتشار للخلايا الأحادية الأنوية حتى تقرحات فى الغدد القاعدية. وأظهرت المقاطع المصبوغة بصبغة البريوديك شيف الى فتحات في الحافة الفرشية ، كما أن عدد الخلايا الكأسية انخفض بشكل ملحوظ بينما كان هناك زيادة إفراز الميوسين ذو الطبيعة الحمضية. أما على مستوى التركيب الدقيق، كان السيتوبلازم يحتوى على فجوات حشوية، وعدم ترتيب للزغيبات مع تحطم للشبكة الليفية الموجودة أسفل الزغيبات وكذلك فقد أوتساع مناطق الوصلات المحكمة بين الخلايا. وتراوحت التغييرات فى الميتوكوندريا بين ضمور أو تضخم واستطالة. أما فى المجموعة المعالجة بالمورينجا فقد كان هناك زيادة معتبرة فى عدد الخلايا الكأسية وكان بشكل رئيسي الميوسين المفرز ذو طبيعة حمضية، والتي ظهرت الحبيبات المخاطية بكثافات الإلكترونية مختلفة عند فحصها بالمجهر الإلكتروني النافذ. أيضا كان هناك زيادة ملحوظة فى تحلل الخلايا وحيدة الأنوية فى منطقة الصفيحة المخصوصة فى كل من المجموعة الثانية والثالثة مقارنة بالمجموعة الأولى الضابطة. وهكذا يشار إلى أن هذه التغييرات الهستولوجية سالفة الذكر تتناسب طرديا مع جرعات الديكلوفيناك صوديوم. وأن الفارق الرئيسي فى العينات المأخوذة من الحيوانات المعالجة هو استقرار أغشية الخلايا مقارنة مع الفئران التي تعرضت للديكلوفيناك صوديوم بدون تناول المورينجا. والخلاصة: تستخلص الدراسة الحالية أن تناول أوراق المورينجا قد يكون لها تأثير وقائي محدود وجزئى على الغشاء المخاطي للاثني عشر فى حالات التعرض لجرعات كبيرة.

TABLE OF CONTENTS

Acknowledgment	iv
Abstract	V
Arabic Abstract	Vi
TABLE OF CONTENTS	Vii
LIST OF FIGURES	Viii
LIST OF TABLES	xiv
LIST OF ABBREVIATIONS	xv
Chapter I: INTRODUCTION	1
1.1-Aim of the work	2
Chapter II: REVIEW OF LITERATURE	
2.1 Diclofenac Sodium	3
2.1.1 Name of the drug.....	3
2.1.2 Description.....	3
2.1.3 Pharmacology.....	3
2.1.4- Gastrointestinal Toxicity.....	4
2.1.5 Mechanism of action of NSAIDs.....	5
2.2.1Histology of the duodenum	10
2.2.2Cell Types in Mucosa.....	11
2.2.2.1 Goblet Cells.....	11
2.2.2.2 Enteroendocrine Cells.....	11
2.2.2.3 Paneth Cells.....	12
2.2.2.4The Submucosal Nerve Plexus.....	13
2.3 Duodenal Ulcer	15
2.3.1Pathology and biopsy of the duodenum.....	15
2.3.2 Peptic ulcer Disease.....	16
2.3.3Epidemiology.....	17
2.3.4 Regulation and stimulation of gastric acid.....	17
2.4 Moringa oleifera	19
2.4.1Introduction and geographical Distribution.....	19
2.4.2- Description.....	20
2.4.3-Origin and Distribution.....	21
2.4.4- Medicinal uses.....	21
2.4.5 Chemical Constituents.....	22
2.4.6 Pharmacological activities.....	23
Chapter III MATERIALS AND METHODS	27
3.1 Drugs and preparations:.....	27
3.2 Experimental animals.....	27

3.3 –Methods.....	28
3.3.1Preparation of Tissues for Light microscopy.....	28
3.3.2- Preparation of Tissues for Electron Microscopic study	29
3.4-Morphometric Study.....	20
3.5-Statistical study.....	30
Chapter IV:RESULTS	31
4.1 Light microscope Results	31
4.1.1GroupI: control.....	34
4.1.2Group II	36
4.1.2.1 Subgroup IIa: DS (50 mg/kg)	36
4.1.2.2 Subgroup IIb : DS (100 mg/kg)	39
4.1.2.3 Subgroup IIc : DS (150 mg/kg)	42
4.1.3 Group III	45
4.1.3.1 Subgroup IIIa :(MO+ 50 mg/kg of DS).....	45
4.1.3.2 Subgroup IIIb : (MO+ 100 mg/kg of DS).....	47
4.1.3.3 Subgroup IIIc : (MO+ 150 mg/kg of DS).....	50
4.2 Electron microscopic Results	53
4.2.1 Transmission Electrom Microscopy (TEM)	53
4.2.1.1 Group I: control.....	53
4.2.1.2Group II & GroupIII.....	55
4.2.1.3 Subgroup IIa & Subgroup IIIa.....	55
4.2.1.4 Subgroup IIb & Subgroup IIIb	57
4.2.1.5 Subgroup IIc & Subgroup IIIc	59
4.2.2 Scanning Electron Microscopy (SEM).....	61
4.2.2.1 Group I: control	61
4.2.2.2 Subgroup IIc :150 mg/kg of diclofenac sodium.....	63
4.2.2.3 Subgroup IIIc :M+ 150 mg/kg of diclofenac sodium.....	66
4.3 The Morphometric and Statistical Results	67
Chapter V: DISCUSSION	69
Chapter VI: CONCLUSION AND RECOMMENDATIONS.....	76
Chapter VII: SUMMARY	77
REFERENCES	81
APPENDECES.....	88

LIST OF FIGURES

Fig. 2.2. Diagram of the human duodenum.....	6
Fig. 2.3. A photomicrograph showing the duodenal mucosa.....	10
Fig. 2.4. A photomicrograph showing Goblet cell over the villi by light microscope.....	11
Fig. 2.5. A TEM micrograph of an enteroendocrine cell.....	12
Fig. 2.6. A photomicrograph showing the deep region of the mucosa and sub mucosa.....	13
Fig. 2.7. A photomicrograph showing A duodenal ulcer.....	15
Fig. 2.8. This is a photograph of the duodenum. This photograph shows a completely normal duodenum, the folds are normal, the color is completely normal, there are no ulcers and there is no irritation. This portion is examined during an upper endoscopy.....	16
Fig. 2.9. Leaves of <i>Moringa oleifera</i>	19
Fig. 2.10. Powder and seeds of <i>Moringa oleifera</i>	20
Fig. 3.1. The used light microscope (Olympus BX51) with its digital camera (DP 20).....	30
Fig. (4.2): A photomicrograph of the duodenum, showing the Leaf like appearance of the duodenal villi. Notice the high columnar absorbing cell with oval nuclei occupying the middle third of their cytoplasm. Group I H&E X200.....	32
Fig.(4.3): A higher magnification of the previous section, showing the lining columnar absorbing cells of the mucosa and few goblet cells (GO) in between. Notice the lamina propria of the villous core with smooth muscle fibers (f) and blood lacteal capillaries (c) Group I H&E X400.....	33
Fig. (4.4): A higher magnification of the crypts and part of Brunner's gland (Bg). Notice mitotic figures of upper part of cell Lining the crypt (Cr). Group I. H&E X60.....	33
Fig. (4.5): A photomicrograph of the duodenal villi, showing goblet cells (Go) with different grades alcian blue-PAS positive reaction. Notice the continuous PAS positive apical brush border. Group I PAS-alcian blue .X600.....	34
Fig. (4.6): A photomicrograph of the crypts, showing the predominance of combined PAS-alcian blue positive reaction of goblet cells between the cells of the crypt. Notice the thin continuous PAS positive basement membrane. Group I PAS-alcian blue .X600.....	34
Fig. (4.7): A higher magnification of the acini of Brunner's gland in the submucosa, showing the apical PAS positive reaction of the lining epithelium. The basement membrane has a thin continuous PAS positive (Ab). Group I PAS-alcian blue .X600.....	35
Fig. (4.8): A photomicrograph of the duodenal wall, showing apparent preservation of the crypt villous ratio as compared with the control sections. Subgroup IIa H&E X100.....	35
Fig. (4.9): A higher magnification of some duodenal villi showing broadening of the villi with Grunhagen subepithelial spaces. Notice the blood lacteals (L). "Chiu's level I" Subgroup IIa H&E X40.....	37
Fig.4.10.) A. A higher magnification of some duodenal villi, showing focal loss of the apical PAS positive brush border with few goblet cells. B. showing apparent decrease in the PAS positive reaction of goblet cells between the cells of the crypt compared to control.....	38

Fig. (4.11) A photomicrograph of a longitudinal section of duodenum, showing different levels of affection detachment of the lining epithelium of many villi. Notice apparent disturbed crypt/ villous ratio. Chiu's level 2 and 3.....	40
Fig.(4.12): A higher magnification of previous section A. the villous showing formation of Grunhagen's subepithelial spaces mostly all around the villous (*) (Chiu's level 2). Notice marked polymorphic mononuclear cell infiltration of the lamina propria with dilated capillaries (arrowhead) (Chiu's level 3). B. showing some crypts with apparent control appearance. Notice few eosinophils (E) and paneth cells. Subgroup I Ib H&E X400.....	41
Fig. (4.13): A Higher magnification of the duodenum, A. showing the apical PAS positive reaction of the thick brush border (arrowhead) on unseparated cells. Notice the acidic alcian blue staining of most goblet cells compared to the PAS positive brush border. B. showing the crypts with predominance of positive alcian blue positive reaction of goblet cells between the cells of the crypt. Notice increased PAS positive reaction of cells lining the acini of Brunner's gland compared to control sections. Subgroup I Ib-PAS-alcian blue X400.....	41
Fig. (4.14): A Photomicrograph of a TS section of the duodenal wall showing marked disturbed vilous/crypt ratio with marked destruction of villous structure (Level. 3,4). Notice marked mononuclear cellular infiltration. Brunner's gland (*), inner circular (IC) and outer longitudinal layer muscle layer (OL). Subgroup I Ic H&E X100	43
Fig. (4.15): A higher magnification of duodenal villi, A. showing detached epithelium dark pyknotic nuclei with homogenous acidophilic cytoplasm. The lamina propria is markedly congested with severe mononuclear cellular infiltration. B. glandular region showing nearly appearance of control section except to intracellular lymphocytes (→). Notice the lamina propria is crowded by the congested capillaries and mononuclear cells. Paneth cells (p) and Mitotic figures (Mi).Subgroup I Ic H&E X400	43
Fig. (4.16): Photomicrographs of sections in the duodenum, A. showing marked decrease of goblet cells over the villi. X200. B. A higher magnification of the glandular part and submucosa of the duodenum, showing few goblet cells with acidic alcian blue reaction. Notice intense PAS positive reaction of cells lining the acini of Brunner's gland. C. showing the crypts of unaffected glandular part with predominance of positive combined PAS-alcian blue reaction of goblet cells between the cells of the crypt.Subgroup I Ic-PAS-alcian blue X400	44
Fig. (4.17): A photomicrograph of the rat duodenum, showing a similar arrangement of the villi to the control with mononuclear cell infiltration of the lamina propria. Notice the wide lumen of the crypt (green star).Subgroup I Ia H&E X200.....	46
Fig.(4.18): A. A higher magnification of villi, showing the intense PAS positive reaction of goblet cells with thick complete PAS positive brush border. B. the glandular area has apparent increased number of PAS positive cell an secretion filling their lumena. Notice with few goblet cells with combined reaction (◄). Subgroup I Ia PAS-alcian blue X600.....	46
Fig. (4.19): A photomicrograph of a transverse section showing A. whole thickness of duodenum with apparently broad glandular area. B. High magnification of some duodenal villi showing slender appearance of the villi with few Grunhagen's subepithelial spaces (→) and mononuclear cells of the laminopria. Notice intraepithelial lymphocytes (headarrow).	48

“Chiu’s level I” IIIb H&E X400..... 48

Fig. (4.20): A. a glandular area showing mononuclear cells in the lamina propria between the crypts and even replacing some of them (*). Notice the predominance of eosinophils (→). B, A higher magnification of some crypts, showing large number of cells with pale ballooned cytoplasm with flat compressed nuclei (→). Notice large number of mononuclear cells (thick arrow). Subgroup IIIb, H&E X400..... 49

Fig. (4.21): Photomicrographs of previously described sections, A. showing predominance of acidic reacting goblet cells (◄) in the mucosal lining epithelium compared to the PAS reacting cells of the Brunner’s gland. B. A higher magnification of villi, showing the acidic alcian blue reacting goblet cells with complete PAS positive brush border (→). C. showing the glandular area with apparent increased number of PAS positive cells with few acidic blue reacting cells (→). Notice few goblet cells with combined reaction (◄).Subgroup IIIb, H&E X400..... 51

Fig. (4.22): Photomicrographs of rat duodenum: A) showing disorganized villi with sloughing of the columnar cells lining epithelium (→) with no difference from that administered DS (IIC) . B) the glandular region shows dark pyknotic nuclei with wide lumen filled with secretion and large number of goblet cells. C) The underneath acini of Brunner’ gland has dark peripheral nuclei with highly vacuolated cytoplasm. Subgroup IIIc H&E X400..... 51

Fig. (4.23): A photomicrograph of rat duodenum, showing of the whole thickness of the duodenal mucosa with predominance of positive combined PAS-alcian blue positive reaction of goblet cells between the cells of the crypt. X200 Inset: shows the-PAS positive granules of the paneth cells in the base of the gland (→). X400 Subgroup IIIc PAS-alcian blue..... 52

Fig. 4.24: A TEM micrographs of duodenum from control rat: (A): showing a group of absorptive cells (A) with their basal oval nuclei (N), microvilli (MV). Notice Goblet cell (G) in between the absorptive cells. bar 10µm. (B) A higher magnification of the luminal border showing uniform, closely packed microvilli the glycocalyx (Gc). Notice the actin filaments (thick arrow), terminal web (Tw) with fine fibrils (F), tight junction (→), adherent junction (thick arrow) and desmosomes (arrow head). Bar 1µm. (C): showing the apical region of an absorptive cell with area under the terminal web where oval mitochondria (M), rough endoplasmic reticulum (rER), smooth endoplasmic reticulum (sER) and ribosomes. Bar 1µm 54

Fig. 4.25: TEM micrographs of duodenum from rat from subgroup IIa (A,B,C) and IIIa (D,E,F) (A): showing a goblet cell with multiple heterogenous electron lucent granules enclosed between the apices of 2 absorptive cells. Notice the wide separation between the cells and wide tight junction area (◄). Bar 5µm. (B) The apical part of an absorptive cell has marked disorganization of the microvilli (thick arrow) with shortness and separation. It is difficult to discriminate the terminal web from the underlying cytoplasm .(C) showing cells in the lamina propria, an active plasma cell can be seen. (c). Notice the associated telopodes (→) around a blood capillary. Bar 5mm. (D) showing a goblet cell with multiple homogenous electron lucent mucin granules. Bar 5mm. (E) showing apparently short well organized microvilli with occasional small buds (thick arrow) . Bar 5mm. (F) showing the cells under the basal lamina (→) with the telopodes of talocyte underneath the crypt lining epithelial cell. Notice the close contact between the mononuclear cells and processes of a talocyte that make junction with them (*)...... 56

Fig. 4.26: TEM micrographs of duodenum from rat from V100 (A,B,C) and V100+M (D,E,F) (A): showing a goblet cell with multiple heterogenous electron lucent granules enclosed between the apices of 2 absorptive cells. Notice the wide tight junction area (◄) and increased filamentous electron density of some of them. Bar 1Um. (B) The apical part of an absorptive cell has marked disorganization of the microvilli (thick arrow) with shortness and separation. It is difficult to discriminate the terminal web from the underlying cytoplasm. Bar 1Um (C) showing cells in the lamina propria, an active plasma cell can be seen (◄). Junctions between connective tissue cells (→) is unclear around a blood capillary (c). Bar 5mm. (D) showing a goblet cell with mucin granules poring mucin between 2 absorptive cells with elongated mitochondria (m) . Bar 5Um. (E) showing well organized microvilli with degeneration of some of them (→). Notice well organized terminal web (TW) . Bar 1mm. (F) showing intact cell membrane of an active plasma cell can be seen (◄) and an eosinophil (E). Notice the evident junctional contact between cells in the lamina propria cells (→)..... 58

Fig. 4.27: TEM micrographs of duodenum from rat from V150 (A,B,C) and V150+M (D,E,F), (A): showing the apical part of an absorptive cell has marked disorganization of the microvilli. The tight junction (thick arrow) between the 2 cells is deformed and no junctional complex underneath with variable size and decrease number of mitochondria. Notice the autophagic vacuoles (head arrow) and group of lysosomes (thin arrow). Inset: showing the globular mitochondria with ballooned cristae. Bar 2µm (B) showing goblet cell (G) with multiple fused mucin granules and remnants of the granular membrane in between granules. Inset: shows persistence of some tight junctions (→) and underneath interdigitating membranes. Bar 2mm. (C) showing in the upper part of the photo, cells in the lamina propria, has disturbed membrane of an eosinophil with its characteristic crystalline granules, while in the lower part shows marked cytoplasmic changes. Blood capillary (c) has closed lumen in the upper photo. Bar 1&2µm. (D) showing group of epithelial cells with uneven microvilli and their nuclei appears as hyperchromatic (n) . Bar 5µm. (E) showing a goblet cell with combined well defined mucin granules and areas with electron lucent fused granules (*). Notice the cytoplasm of the cells around with abundant mitochondria (→). Bar 2µm. (F) showing in the upper part cells in the lamina propria, with intact membrane of an eosinophil. (E) in relation to a narrow lumen capillary, while in the lower part shows a blood capillary (c) packed by a neutrophil (NE) obliterating its lumen. Bar 2µm..... 60

Fig. 4.28: Scanning electron micrographs of the control group, A. Cross sectional of duodenal wall showing the regular arrangement of the duodenal villi. bar 500µ. Inset shows a single villous with a regular central core (*). On the right side the hexagonal top appearance of cells (a) and on left side regularly arranges cells with apical brush border (thick arrow). Bar 40µ. B. showing the top surface of absorptive cells and in the middle the surface appearance of a goblet cell with the normal separation between cells (G). Bar 5µ. C. Higher magnification of top surface shows the compact regularly arranged microvilli with uniform diameter. Bar 1µ. D. Higher magnification of the top surface of imprisoned goblet cell (G) between microvilli of the columnar absorptive cells has few irregular microvilli (à) between the mucin material (*). Bar 2µ..... 62

Fig. 4.29: Scanning electron micrographs of the Group IIc, A. showed a the collapsed appearance of villi. Notice the top surface of a villous with irregular cracks of the tip its surface (thick arrow). Bar 500µ. Inset: shows a single villous with an irregular top surface and the lateral surface of a villous has an uneven irregular appearance with loss of the hexagonal appearance. Bar 30µ. B. showing the top surface of a group of absorptive cells, some has a normal microvillous appearance and others has an abnormal appearing microvilli

(*). Bar 2 μ . C. Higher magnification of top surface of the abnormally appearing cells shows their short microvilli (arrow) and areas of loss of microvilli (*). Notice the accumulation of rounded cells (thick arrow). Bar 1 μ 64

Fig. 4.30: Scanning electron micrographs of the Group IIIc, A. showed the top surface of a group of absorptive cells with a velvety appearance with cracked areas (*). Notice a goblet cell with few irregular microvilli (à) . Bar 5 μ . B. Higher magnification of the mentioned group of cells shows their short microvilli with individual tall microvilli (thin arrow). Notice the large emerging rounded cell between microvilli (headarrow). Bar 2 μ . C. showing the top surface of a nearby goblet cell (G) and the surrounding absorptive cells with uniform regularly arranged microvilli (arrows).Bar 1 μ 66

Fig. (31) : Illustrate the changes in the mean villous height and crypt depth in the different groups. 67

Fig. (32) : Illustrate the changes in the number of goblet cell of the crypts in the different groups..... 67

LIST OF TABLES

Table (4.1): Changes in the villous height and crypt depth in different groups.....	67
Table (4.2): Changes in Goblet cell percentage in different groups.....	68

LIST OF ABBREVIATION

BF	buffered formalin
CBS	Cystathionine β -synthase
CMC	Carboxymethyl cellulose
CO	Carbon oxide
COX	Clooxygenase
COX-1	Clooxygenase-1
COX-2	Cyclooxygenase-2
CSE	Cystathionine γ -lyase
DMBA	Dimethylbenz (a) anthracene \
DS	Diclofenac sodium
EBV	Epstein Barr virus
EMU	electron microscopic unit
GIT	Gastrointestinal tract
GH	glutaraldehyde
GTT	Glucose tolerance test
H ₂ S	hydrogen sulphide
HETE	Hydroxyeicosatetraenoic acid.
HPETE	Hydroxyperoxyeicosatetraenoic acid;
INH	Isoniazid
ITC	Isothiocyanate
KFMRC	King Fahd microscopic research center
LO	lipoxygenase
MM	muscularis mucosae
MO	Moringa oleifera lam
NBF	Natural buffered formalin
NO	nitric oxide
NSAIDS	Non-steroidal anti-inflammatory drugs
OTC	Over-the-counter
PAS	Periodic acid Schiff
PG	prostaglandin
PGD ₂	prostaglandin D ₂ ;
PGF ₂ a	prostaglandin E ₂ ;
PGE ₂	prostaglandin F _{2α} ;
PGF ₂	prostaglandin I ₂ ;
RFM	rifampicin
SD	Standard deviation
SEM	Scanning Electron Microscopy
TC	Tthiocarbamate
TEM	Transmission Electrom Microscopy
TXA ₂	thromboxane A ₂